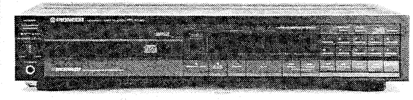
PIONEER®

Service Manual

REPAIR & ADJUSTMENTS



ORDER NO.
ARP1128-0

COMPACT DISC PLAYER

PD-7030(BK)
PD-7030

MODEL PD-7030 (BK) AND PD-7030 COMES IN SIX VERSIONS DISTINGUISHED AS FOLLOWS:

Type	Applicable model		Power requirement	Destination
	PD-7030	PD-7030 (BK)		
KU	–	○	AC120V only	U.S.A.
KC	–	○	AC120V only	Canada
HEM	○	○	AC220V, 240V (Switchable)*	European continent
HB	○	○	AC220V, 240V (Switchable)*	United Kingdom
S	–	○	AC110V, 120V, 220V, 240V (Switchable)	General market
S/G	–	○	AC110V, 120V, 220V, 240V (Switchable)	U.S. Military

* Change the primary wiring of the power transformer.

- **This service manual is applicable to the KU type.**
- **As to the other types, please refer to additional service manual (ARP1131).**
- **Ce manuel d'instruction se refère au mode de réglage en français.**
- **Este manual de servicio trata del método ajuste escrito en español.**

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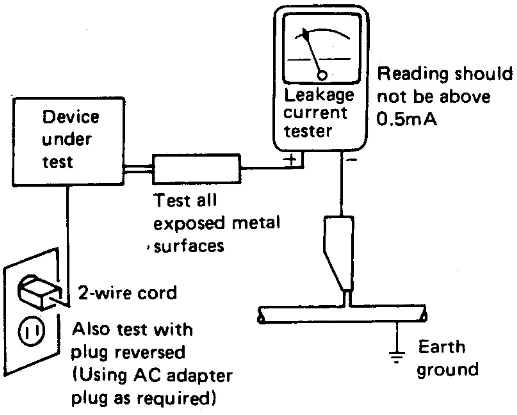
1. SAFETY INFORMATION

1. SAFETY PRECAUTIONS

The following check should be performed for the continued protection of the customer and service technician.

LEAKAGE CURRENT CHECK

Measure leakage current to a known earth ground (water pipe, conduit, etc.) by connecting a leakage current tester such as Simpson Model 229-2 or equivalent between the earth ground and all exposed metal parts of the appliance (input/output terminals, screwheads, metal overlays, control shaft, etc.). Plug the AC line cord of the appliance directly into a 120V AC 60Hz outlet and turn the AC power switch on. Any current measured must not exceed 0.5mA.


Reading should not be above 0.5mA
Leakage current tester
+
−
Device under test
Test all exposed metal surfaces
2-wire cord
Also test with plug reversed (Using AC adapter plug as required)
Earth ground

AC Leakage Test

ANY MEASUREMENTS NOT WITHIN THE LIMITS OUTLINED ABOVE ARE INDICATIVE OF A POTENTIAL SHOCK HAZARD AND MUST BE CORRECTED BEFORE RETURNING THE APPLIANCE TO THE CUSTOMER.

2. PRODUCT SAFETY NOTICE

Many electrical and mechanical parts in the appliance have special safety related characteristics. These are often not evident from visual inspection nor the protection afforded by them necessarily can be obtained by using replacement components rated for voltage, wattage, etc. Replacement parts which have these special safety characteristics are identified in this Service Manual.

Electrical components having such features are identified by marking with a ⚠ on the schematics and on the parts list in this Service Manual.

The use of a substitute replacement component which does not have the same safety characteristics as the PIONEER recommended replacement one, shown in the parts list in this Service Manual, may create shock, fire, or other hazards.

Product Safety is continuously under review and new instructions are issued from time to time. For the latest information, always consult the current PIONEER Service Manual. A subscription to, or additional copies of, PIONEER Service Manual may be obtained at a nominal charge from PIONEER.

2. SPECIFICATIONS

1. General

Type	Compact disc digital audio system
Usable discs	Compact Disc
Signal format	Sampling frequency: 44.1 kHz Quantized bit number: 16 bit linear
Power requirements	
European models	AC 220 V, 50/60 Hz
U.K., Australian models	AC 240 V, 50/60 Hz
U.S., Canadian models	AC 120 V, 60 Hz
Other models	AC 110/120/220/240 V (switchable), 50/60 Hz
Power consumption	
European, U.K., Australian, U.S., Canadian models	18 W
Other models	12 W
Operating temperature	+5°C - +35°C
Weight	
U.S. military model	5.3 kg (11 lb, 11 oz)
Other models	4.5 kg (9 lb, 15 oz)
External dimensions	
U.S. military model	457(W) x 290(D) x 84(H) mm 18 (W) x 11-3/8 (D) x 3-1/4 (H) in
Other models	420(W) x 290(D) x84(H) mm 16-1/2 (W) x11-7/16 (D)x 3-5/16 (H) in

2. Audio section

Frequency response	4 Hz - 20 kHz (±0.5 dB) (EIAJ)
S/N	98 dB or more (EIAJ)
Dynamic range	95 dB or more (EIAJ)
Channel separation	94 dB or more (EIAJ)
Total harmonic distortion	0.004 % or less (EIAJ)
Output voltage	2.0 V ± 0.5 V (EIAJ)
Wow and flutter	Limit of measurement (± 0.001% W.PEAK) or less (EIAJ)
Number of channels	2 channels (stereo)

3. Functions

- Play
- Pause
- Manual search
- Programmed playback
- Track search
- Programmed repeat
- Pause program
- Direct track search
- Direct programming
- All track repeat
- Add-on program
- Auto programmed editing
- Timer start

The above functions can be operated with the remote control unit.

4. Accessories

● Remote control unit	1
● Size AA/R6 dry batteries	2
● Output cable	1
● Operating instructions	1

The specifications and design of this product are subject to change without notice, due to improvements.

3. PANEL FACILITIES

FRONT PANEL

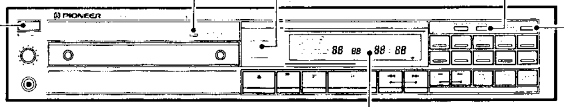
EDITING key (AUTO PGM EDITING)
Press to program a tune which may be played back within a specified time.

TIME key

- ● Use to select the method for displaying the playing time on the indicator panel.
  Each time the key is pressed, the indication changes from TIME, REMAIN, to TOTAL in that order. (For details concerning the display contents, refer to the explanation about the indicators.)
- ● If pressed after pressing the TRACK NO. key, the playback time of the selected track only is displayed.

POWER switch
Press to turn power to the unit ON and OFF.
If there is a disc in the unit when power is turned ON, playback will begin automatically. (Timer start function)

REMOTE SENSOR/Indicator



Indicators

REPEAT : Lights during repeat play.
PROGRAM : Lights after programming (after program has been memorized).
TIME/REMAIN/TOTAL : Changes each time the TIME key is pressed.
● TIME : Displays the track number of the track being played, the index number *1, and the playback time (minutes and seconds).
● REMAIN : Displays the track number of the track being played, the index number, and the remaining amount of time required to play from the current position to the end of the track. (In minutes and seconds)
● TOTAL : Displays the total number of tracks on one disc (TRACK) and the overall playback time (MIN, SEC).

During programmed playback operation, displays the remaining playback time of the programmed tracks (REMAIN), and the total playback time (TOTAL).

TRACK : Indicates current track number, and track numbers within program. The lower figures light up in accordance with the number of tracks recorded on the disc, and the numbers of the tracks which have been played extinguish in order. (During programmed playback only the programmed tracks light.) Above number 16, the ➡ mark lights.
INDEX : Displays index numbers which divide the music and tunes within one track. During programmed playback displays the step number.
MIN : Displays the playback time or remaining time in minutes.
SEC : Displays the playback time or remaining time in seconds.

*1 The INDEX is a signal which is recorded within a track, to indicate division of the track into separate tunes and items of music.

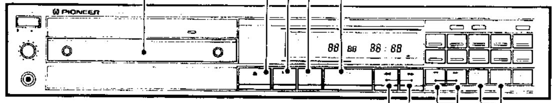
OPEN/CLOSE key
Press when you wish to eject or load a disc. Each time the key is pressed, the tray is alternately pushed out or pulled in.

Disc Tray
This is where the disc is set. When power is switched ON and the OPEN/CLOSE key is pressed, the tray is ejected forward.
To insert the tray, press the OPEN/CLOSE key, or lightly push the tray in with your finger. During play operation, pressing the PLAY key causes the tray to be inserted automatically.

STOP/CLEAR Key
Press to stop playback. When pressed, the player goes into stop mode and all operations stop.
Press to clear a program. When pressed during stop mode, the program stored in memory is cleared.

PAUSE key/Indicator
Press to temporarily interrupt playback. When pressed again, the pause mode is cancelled and playback resumes.

PLAY key/Indicator
Press to begin playback, and to cancel the pause mode.



TRACK SEARCH keys
When the player is in the normal play, programmed play or pause modes, these keys are pressed to search for a desired track. Pressing either key causes the player to advance to the next track, or return to the previous track. The keys can also be used to check the contents of a program during program entry (but only when the player is stopped).

[►►|] : When pressed once, the disc playback advances to the beginning of the next track on the disc; when pressed continuously, the disc playback moves to the beginning of succeeding tracks on the disc. (During programmed playback, it moves to the beginning of the next programmed track.)
[|◄◄] : When pressed once, the disc playback returns to the beginning of the currently playing track; when pressed continuously, the disc playback moves further in reverse to the beginning of previous tracks on the disc. (During programmed playback it returns to the beginning of the previously programmed track.)

MANUAL SEARCH Keys
When the player is in play or pause modes, these keys are pressed to perform fast forward or fast backward operations, to allow manual searching. These operations are only carried out during the time either key is pressed. If pressed for more than 2 seconds, the speed increases.

[►►] : Fast forward operation (If fast forward operation is performed to the end of the disc," End" will be displayed and the player will enter pause mode.)
[◄◄] : Fast backward operation (If fast backward operation is performed to the beginning of the disc, the player will enter pause mode.) If these operations are performed during programmed play mode, the player will enter pause mode just before transferring to the next (or previous) track.

INDEX SEARCH keys
These keys are used during play or pause mode, to search for the division (index) between items of music or tunes within one track. Pressing either key causes the player to advance to the next index, or return to the previous index.

[▷▷|] : When pressed, the disc playback advances to the the next index number.
[|◁◁] : When pressed, the disk playback returns to the beginning of the currently playing index number.

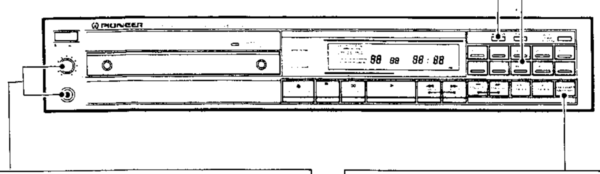
REPEAT key

Press to perform repeat playback

- If pressed during normal playback mode, all tracks on the disc will be repeatedly played back.
- If pressed during programmed playback, the programmed tracks will be repeatedly played back in the programmed order.

TRACK NO. keys (1 to 0)

- Use to specify track numbers (track 1 - track 99) for selection of tracks, program entry, or to confirm playback time.
- Use to specify time (in minutes), during auto program editing.


PIONEER
88 88 88:88

PHONES (headphones) jack

When you wish to use headphones, insert the plug for the headphones into the headphone jack.

PHONES LEVEL control knob

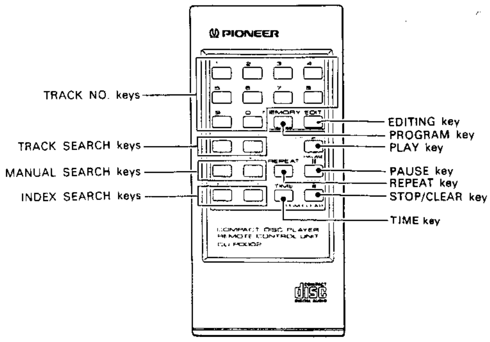
Use to adjust the level of sound when using headphones. Turning the knob to the right increases the sound level.

PROGRAM key (PROGRAM MEMORY)

Used to program a sequence of tracks.

- Press this key after selecting a desired track with the track number keys. Tracks will be added to the program in the order in which they are selected.
- When pressed during normal playback mode, allows the currently playing track to be added to the program.

REMOTE CONTROL UNIT


PIONEER
TRACK NO. keys
TRACK SEARCH keys
MANUAL SEARCH keys
INDEX SEARCH keys
EDITING key
PROGRAM key
PLAY key
PAUSE key
REPEAT key
STOP/CLEAR key
TIME key
COMPACT DISC PLAYER REMOTE CONTROL UNIT
COMPACT DISC DIGITAL AUDIO

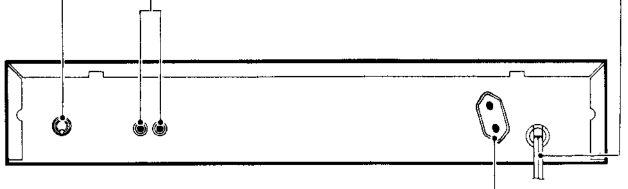
REAR PANEL

SUBCODE OUT terminal

This terminal will be used or outputting subcodes (data recordable on compact discs together with audio signals) in future audio applications.

AUDIO OUT terminal

Power cord



AC OUTLET (UNSWITCHED, MAX. 100 W)

- Power is continuously supplied to the component connected here, regardless of the setting of the power switch (ON/OFF). Turn the connected component ON/OFF by using its own power switch.
- Make sure that the power consumption of the connected component does not exceed 100 W.

NOTE:

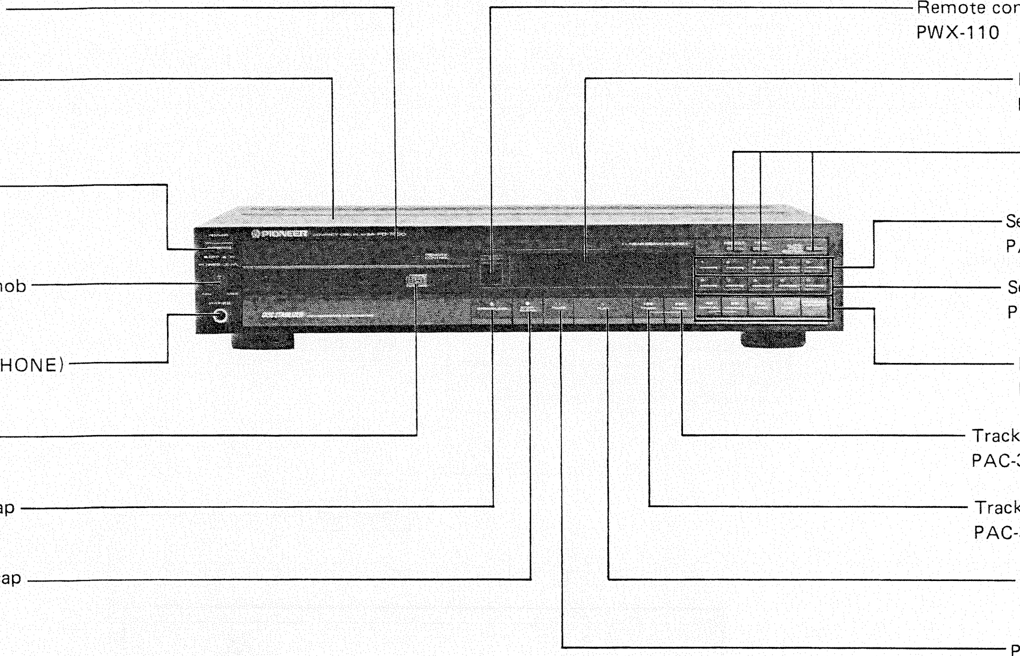
- *Never connect any appliance (toaster, hair dryer, etc.) whose power consumption exceeds the wattage (W) noted on the outlet panel. Damage to components or fire hazards could result.*
- *Even if a television set has a rated power consumption less than the permissible outlet wattage, when its power is first turned on it may have a temporary electrical current flow that exceeds the permissible value. For this reason, do not connect television sets or monitors to this outlet.*
- *Australian model is not provided with this outlet.*

4. PARTS LOCATIONS

NOTES:

- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
- *For your parts Stock Control, the fast moving items are indicated with the marks ★★ and ★.*
  ★★ GENERALLY MOVES FASTER THAN ★
  This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.
- *Parts marked by "◉" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.*

Front View



Function panel
PNY-598

Bonnet
PNA-284

Power button
PAC-363

Headphone knob
PAC-266

Jack (HEADPHONE)
PKN-004

Name plate
PNY-573

O/C button cap
PAC-358

Stop button cap
PAC-360

Remote control sensor unit
PWX-110

Display window
PAM-216

Trick button
PAC-355

Select button (A)
PAC-353

Select button (B)
PAC-354

Program button
PAC-356

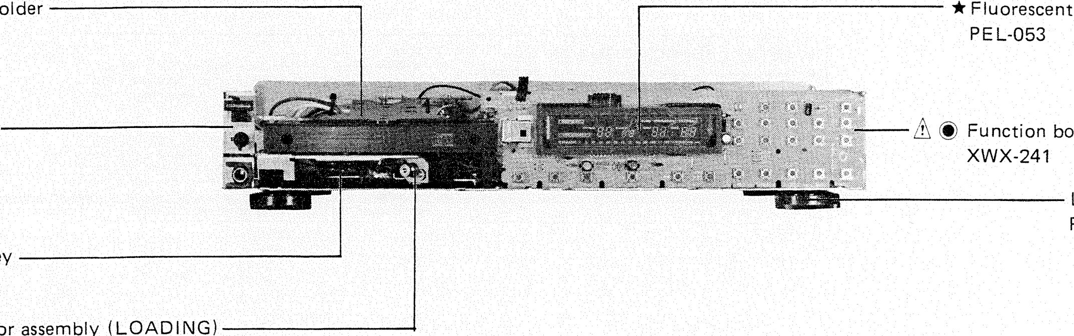
Track button cap (R)
PAC-362

Track button cap (L)
PAC-361

Play button cap
PAC-357

Pause button cap
PAC-359

Front View with Front Panel Removed



Clamper holder
PNY-593

Angle (A)

Gear pulley
PNY-603

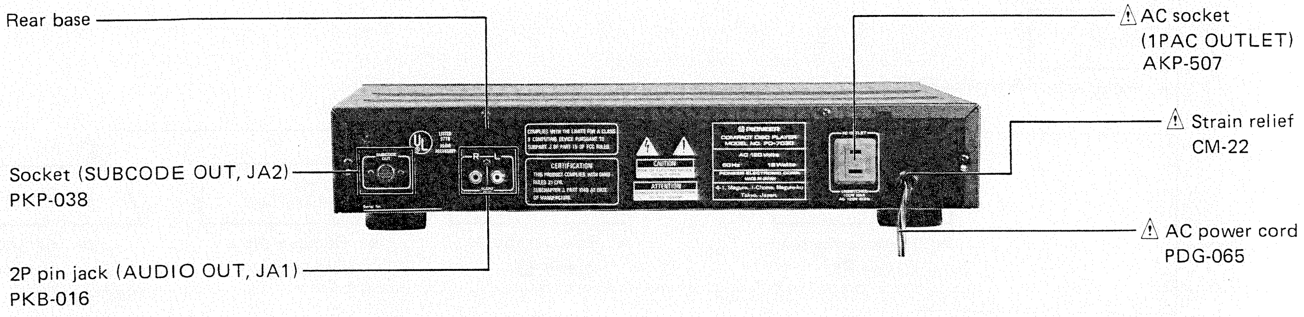
★★ Motor assembly (LOADING)
PYY-514

★ Fluorescent tube (V201)
PEL-053

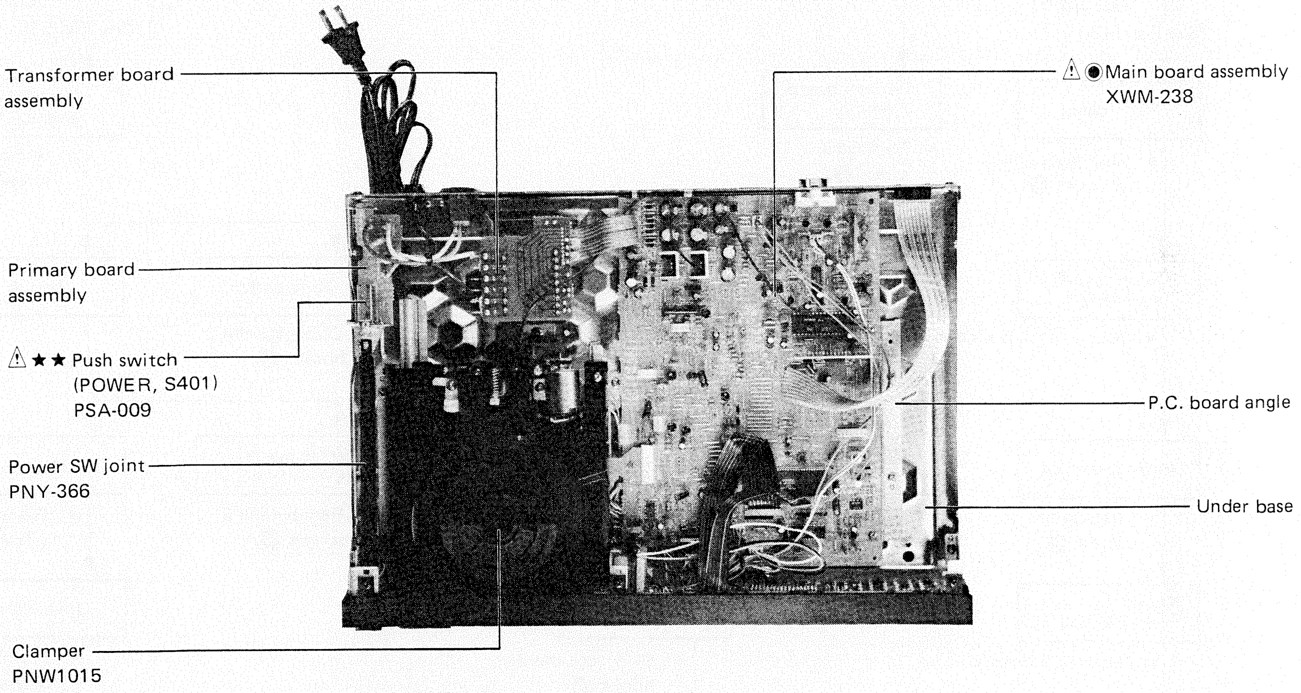
⚠ ◉ Function board assembly
XWX-241

Leg assembly
PXB-494

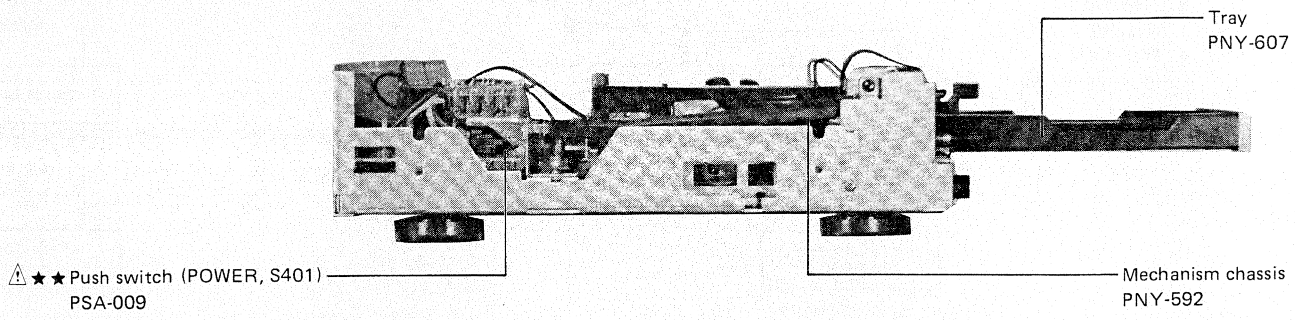
Rear View


Rear base
Socket (SUBCODE OUT, JA2)
PKP-038
2P pin jack (AUDIO OUT, JA1)
PKB-016
⚠ AC socket
(1PAC OUTLET)
AKP-507
⚠ Strain relief
CM-22
⚠ AC power cord
PDG-065

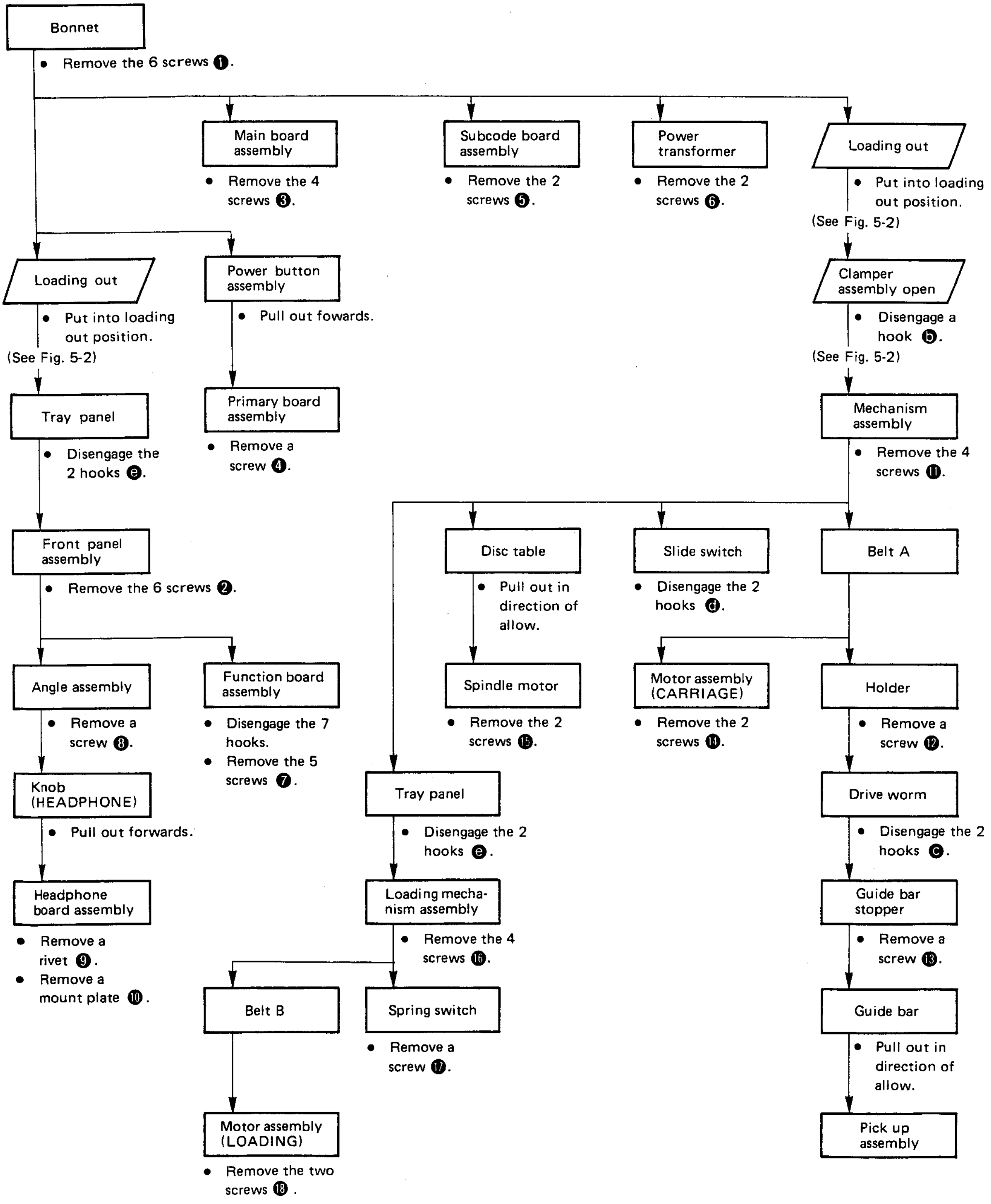
Top View with Bonnet Removed


Transformer board
assembly
Primary board
assembly
⚠ ★★ Push switch
(POWER, S401)
PSA-009
Power SW joint
PNY-366
Clamper
PNW1015
⚠ ● Main board assembly
XWM-238
P.C. board angle
Under base

Side View with Bonnet Removed


Tray
PNY-607
⚠ ★★ Push switch (POWER, S401)
PSA-009
Mechanism chassis
PNY-592

5. DISASSEMBLY


Bonnet
• Remove the 6 screws ❶.
Main board assembly
• Remove the 4 screws ❸.
Subcode board assembly
• Remove the 2 screws ❺.
Power transformer
• Remove the 2 screws ❻.
Loading out
• Put into loading out position.
(See Fig. 5-2)
Clamper assembly open
• Disengage a hook ⓑ.
(See Fig. 5-2)
Mechanism assembly
• Remove the 4 screws ⓫.
Loading out
• Put into loading out position.
(See Fig. 5-2)
Power button assembly
• Pull out fowards.
Primary board assembly
• Remove a screw ❹.
Tray panel
• Disengage the 2 hooks ⓔ.
Front panel assembly
• Remove the 6 screws ❷.
Angle assembly
• Remove a screw ❽.
Knob (HEADPHONE)
• Pull out forwards.
Headphone board assembly
• Remove a rivet ❾.
• Remove a mount plate ❿.
Function board assembly
• Disengage the 7 hooks.
• Remove the 5 screws ❼.
Disc table
• Pull out in direction of allow.
Spindle motor
• Remove the 2 screws ⓯.
Slide switch
• Disengage the 2 hooks ⓓ.
Motor assembly (CARRIAGE)
• Remove the 2 screws ⓮.
Belt A
Holder
• Remove a screw ⓬.
Drive worm
• Disengage the 2 hooks ⓒ.
Guide bar stopper
• Remove a screw ⓭.
Guide bar
• Pull out in direction of allow.
Pick up assembly
Tray panel
• Disengage the 2 hooks ⓔ.
Loading mechanism assembly
• Remove the 4 screws ⓰.
Belt B
Motor assembly (LOADING)
• Remove the two screws ⓲.
Spring switch
• Remove a screw ⓱.

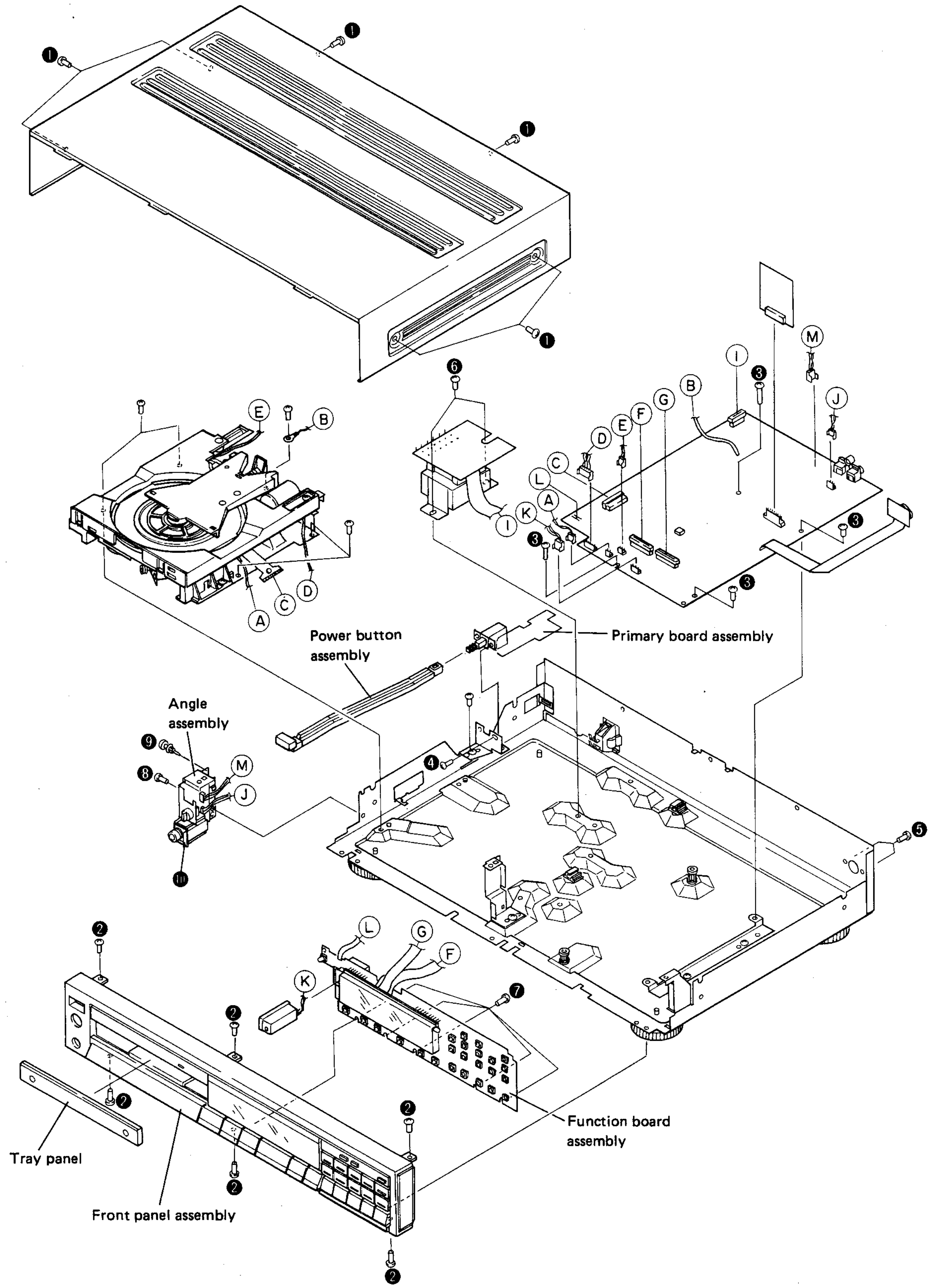

❶
Power button assembly
Primary board assembly
Angle assembly
Tray panel
Front panel assembly
Function board assembly
A
B
C
D
E
F
G
I
J
K
L
M
❷
❸
❹
❺
❻
❼
❽
❾
❿

Fig. 5-1 Disassembly

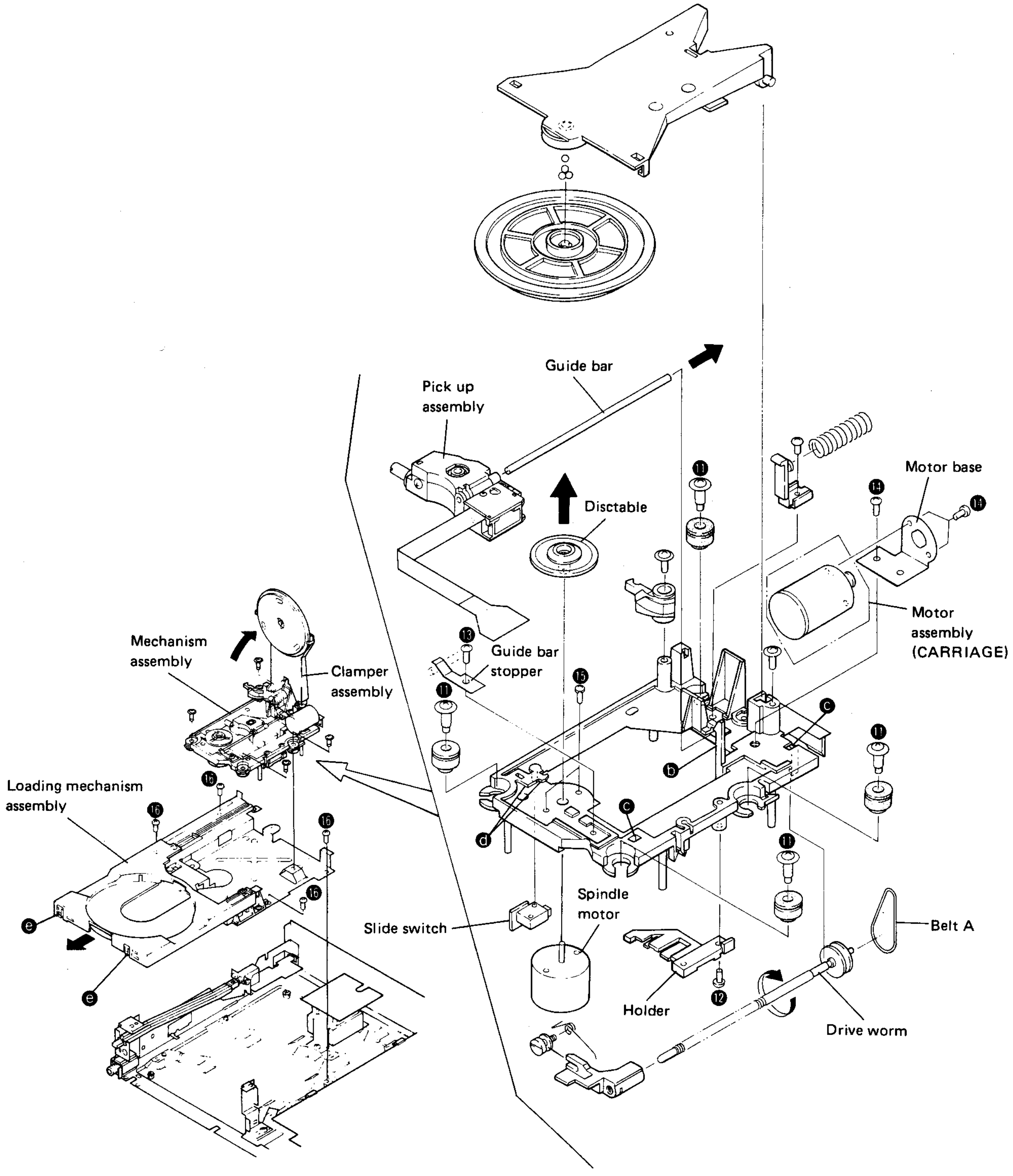

Guide bar
Pick up assembly
Disctable
Motor base
Motor assembly (CARRIAGE)
Guide bar stopper
Mechanism assembly
Clamper assembly
Loading mechanism assembly
Slide switch
Spindle motor
Holder
Drive worm
Belt A
⓫
⓬
⓭
⓮
⓯
⓰
b
c
d
e

Fig. 5-2 Disassembly

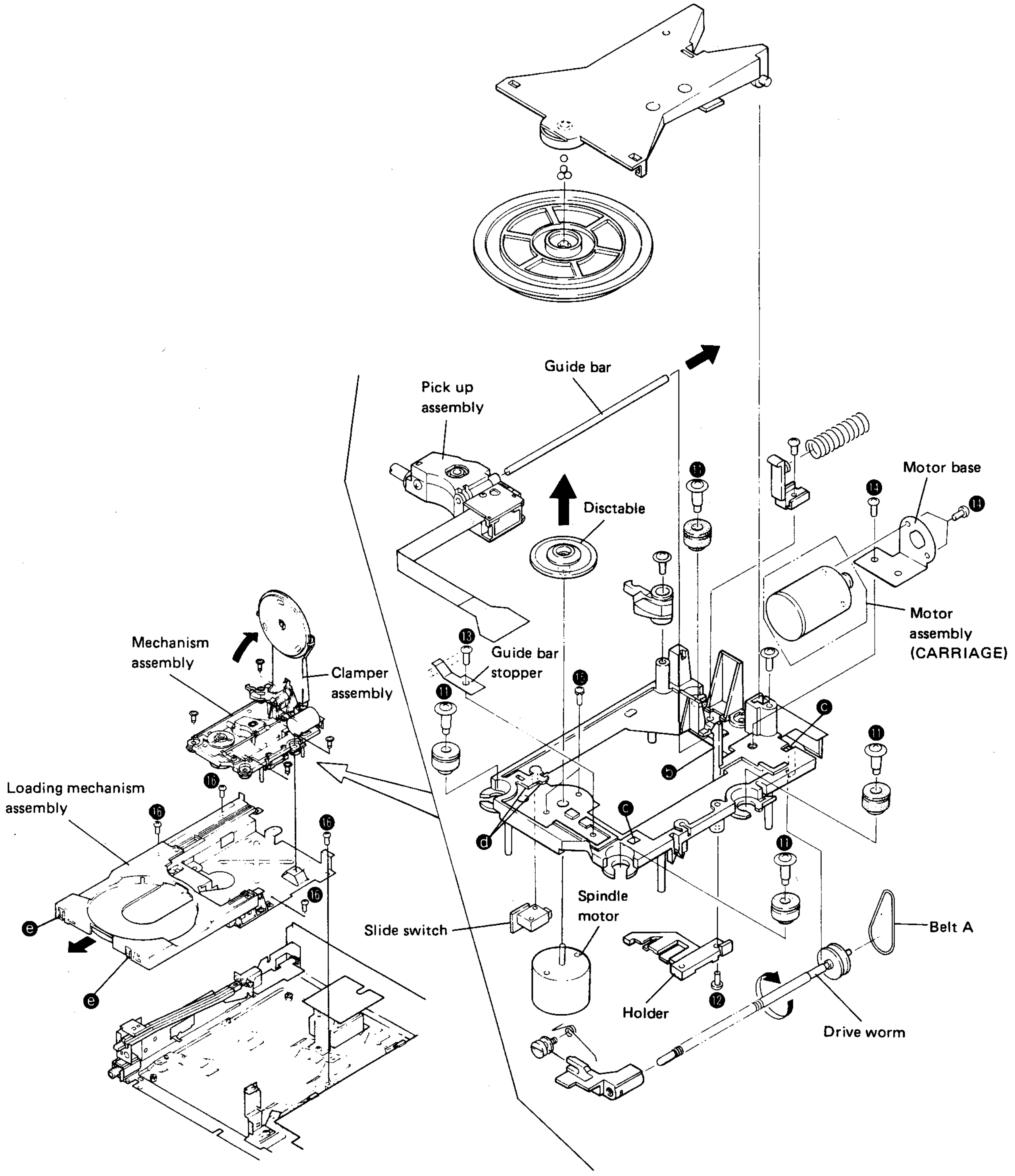

Guide bar
Pick up assembly
Disctable
Motor base
⓮
⓮
⓫
Motor assembly (CARRIAGE)
⓭
Guide bar stopper
⓭
⓫
ⓒ
⓫
❺
ⓒ
ⓓ
⓫
Mechanism assembly
Clamper assembly
Loading mechanism assembly
⓰
⓰
⓰
⓰
ⓔ
ⓔ
Slide switch
Spindle motor
Holder
⓬
Belt A
Drive worm

Fig. 5-2 Disassembly

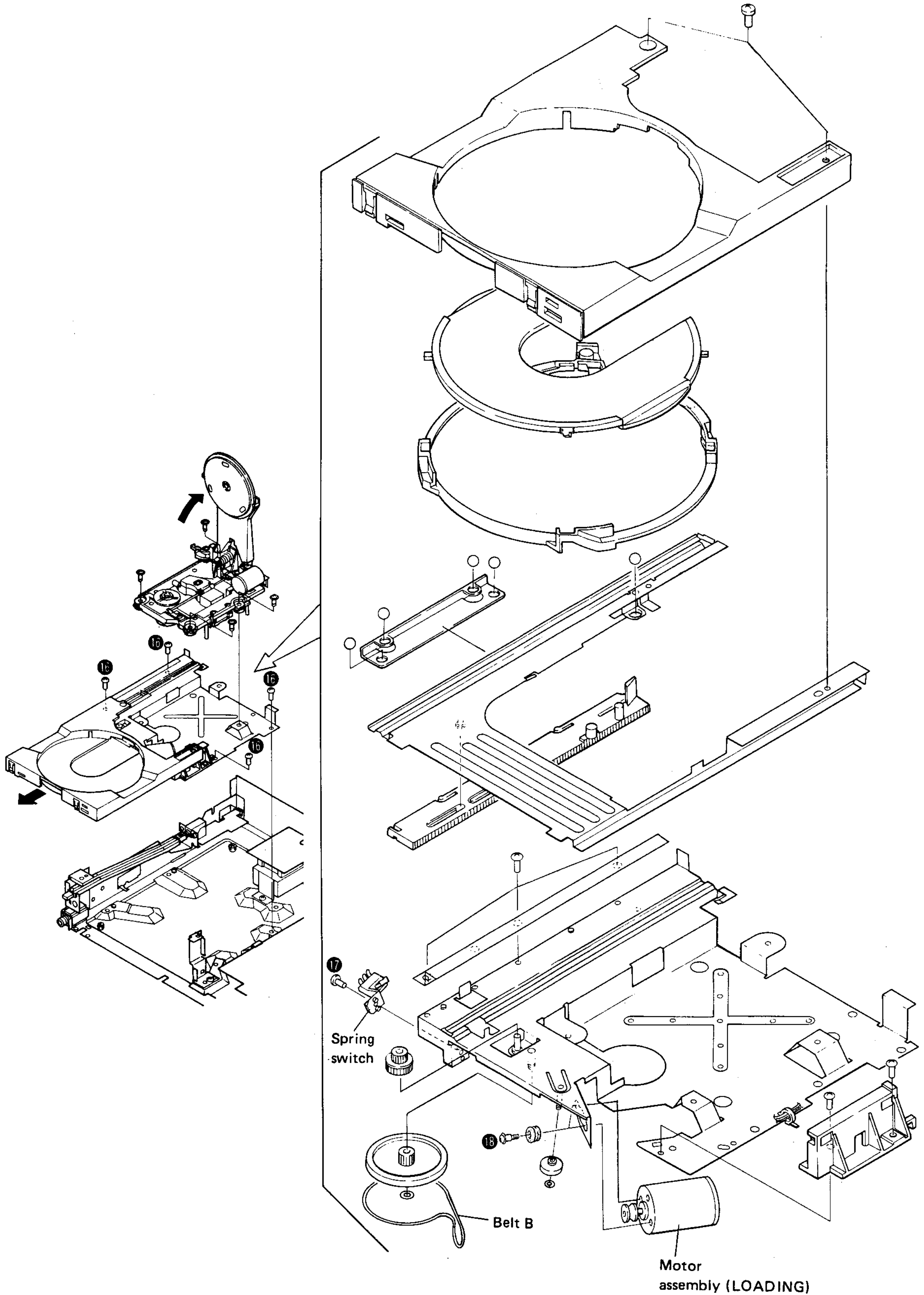
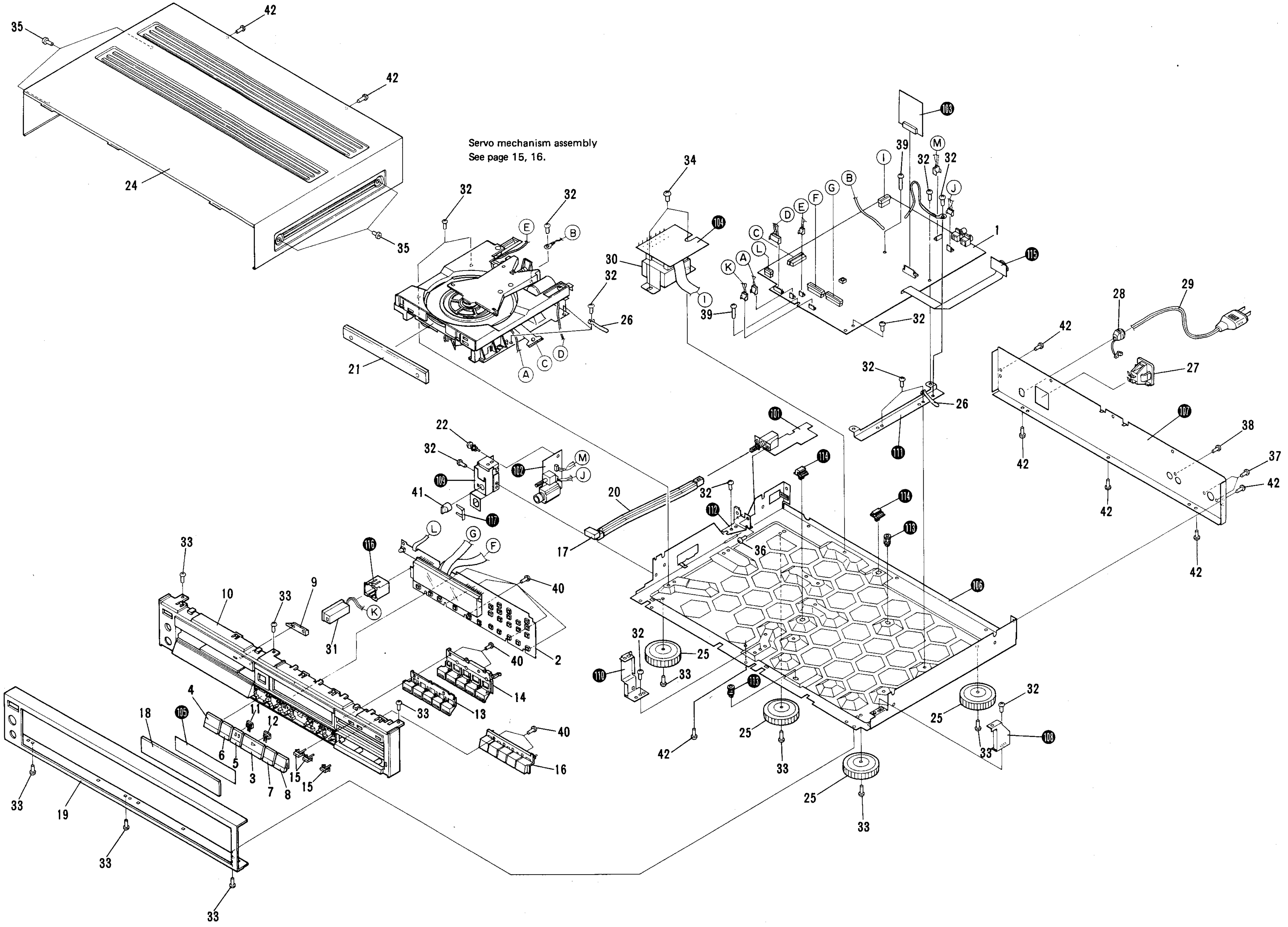

⓰
⓰
⓯
⓰
⓱
Spring switch
⓲
Belt B
Motor assembly (LOADING)

Fig. 5-3 Disassembly

6. EXPLODED VIEWS AND PARTS LIST

6.1 EXTERIOR


A
B
C
D
Servo mechanism assembly
See page 15, 16.
35
42
42
24
35
32
32
E
B
34
104
30
32
26
21
A
C
D
103
39
M
32
32
I
J
B
G
F
E
D
C
L
A
K
1
115
39
I
32
28
29
42
27
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26
111
107
22
32
109
102
M
J
41
117
20
101
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42
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116
L
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K
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32
25
33
110
113
106
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108
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42
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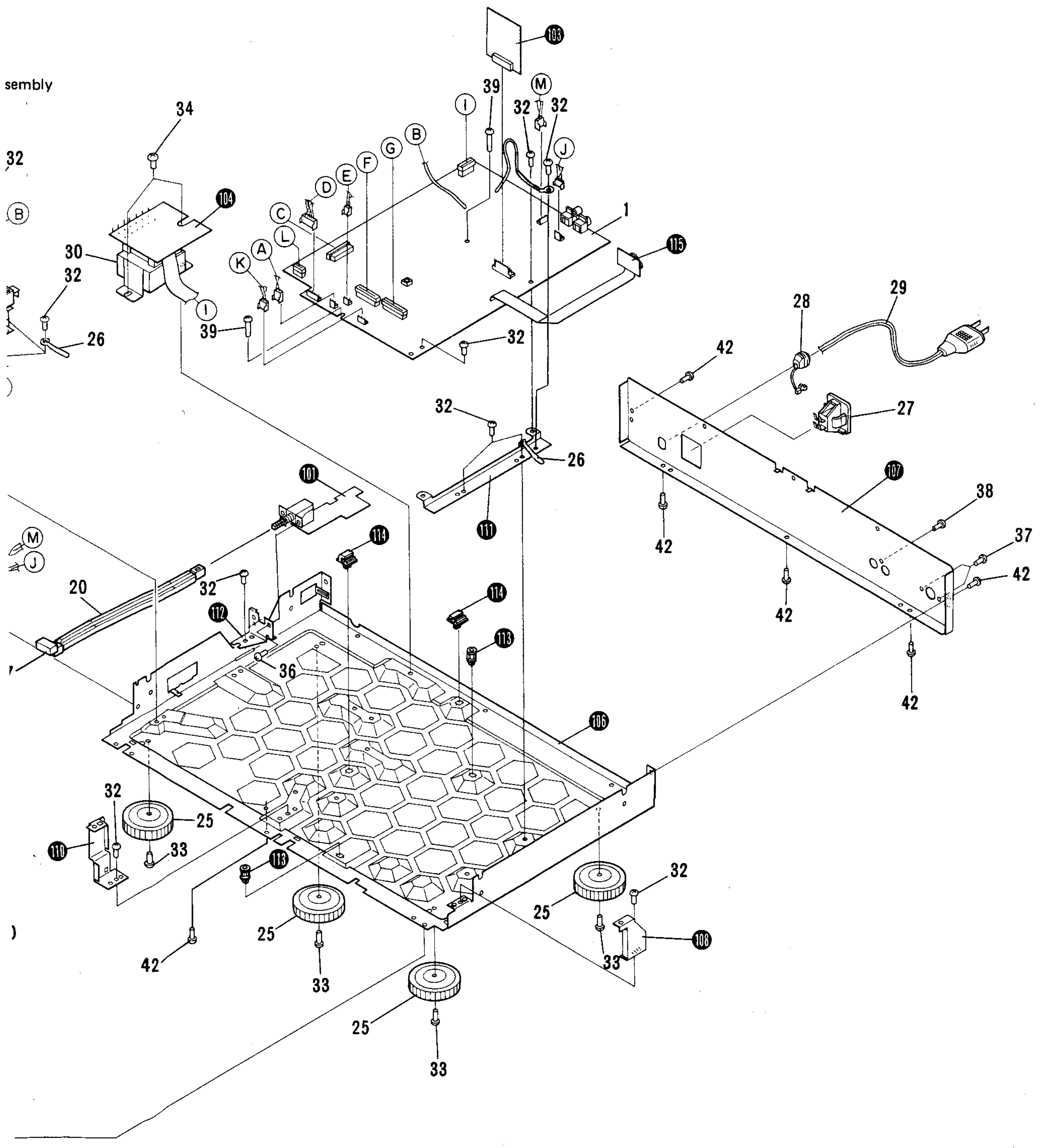
33
19
33
33

EXTERIOR

Parts List

Mark		No.	P
⚠	●	1.	X
⚠	●	2.	X
		3.	P
		4.	P
		5.	P
		6.	P
		7.	P
		8.	P
		9.	P
		10.	P
		11.	P
		12.	P
		13.	P
		14.	P
		15.	P
		16.	P
		17.	P
		18.	P
		19.	P
		20.	P
		21.	P
		22.	.
		23.	P
		24.	P
		25.	P
		26.	R
⚠		27.	A
⚠		28.	C
⚠		29.	P
⚠	★	30.	P
		31.	P
		32.	B
		33.	B
		34.	B
		35.	F



NOTES:

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  ★★ GENERALLY MOVES FASTER THAN ★
  This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.
- *Parts marked by "◉" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.*

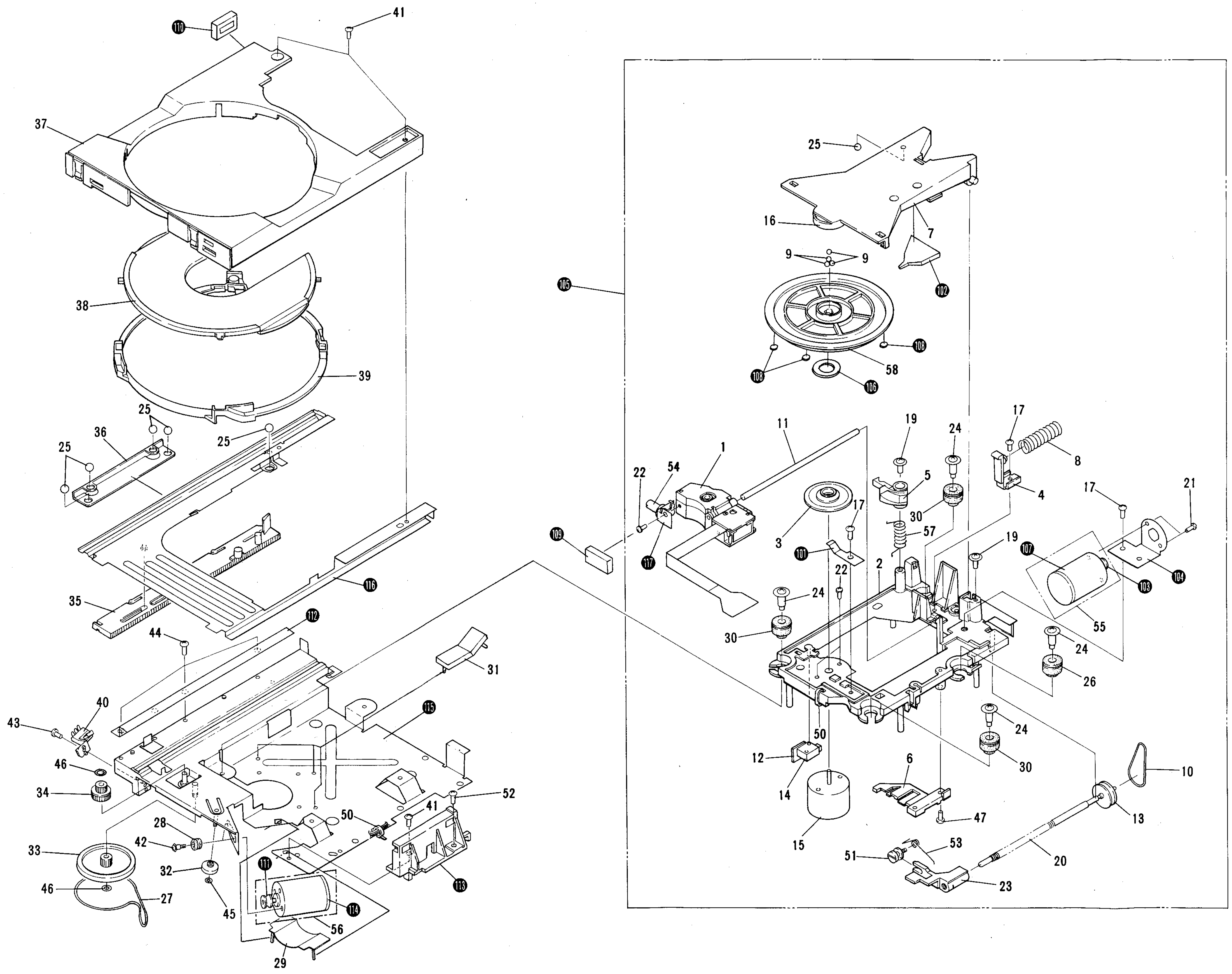
EXTERIOR

Parts List

Mark	No.	Part No.	Description
⚠ ◉	1.	XWM-238	Main board assembly
⚠ ◉	2.	XWX-241	Function board assembly
	3.	PAC-357	Play button cap
	4.	PAC-358	O/C button cap
	5.	PAC-359	Pause button cap
	6.	PAC-360	Stop button cap
	7.	PAC-361	Track button cap (L)
	8.	PAC-362	Track button cap (R)
	9.	PNY-571	Lens
	10.	PNY-598	Function panel
	11.	PNY-600	Pause lens
	12.	PNY-599	Play lens
	13.	PAC-353	Select button (A)
	14.	PAC-354	Select button (B)
	15.	PAC-355	Trick button
	16.	PAC-356	Program button
	17.	PAC-363	Power button
	18.	PAM-216	Display window
	19.	PAN-137	Front panel
	20.	PNY-366	Power SW joint
	21.	PNY-573	Name plate
	22.	....	....
	23.	PEC-030	Binder
	24.	PNA-284	Bonnet
	25.	PXB-494	Leg assembly
	26.	RNH-184	Cord retainer
⚠	27.	AKP-507	AC socket 1P (AC OUTLET)
⚠	28.	CM-22	Strain relief
⚠	29.	PDG-065	AC power cord
⚠ ★	30.	PTT-263	Power transformer (120V)
	31.	PWX-110	Remote control sensor unit
	32.	BBZ30P060FMC	Screw
	33.	BBZ30P080FZK	Screw
	34.	BBZ40P080FMC	Screw
	35.	FBT40P080FZK	Screw

Mark	No.	Part No.	Description
	36.	PMZ30P060FMC	Screw
	37.	PPZ26P060FZK	Screw
	38.	PPZ30P080FZK	Screw
	39.	IBZ30P150FCU	Screw
	40.	PPZ30P100FMC	Screw
	41.	RAC-266	Headphone knob
	42.	BBZ30P060FZK	Screw
	101.		Primary board assembly
	102.		Headphone board assembly
	103.		Digital filter board assembly
	104.		Transformer board assembly
	105.		FL filter
	106.		Under base
	107.		Rear base
	108.		Front angle (C)
	109.		Angle (A)
	110.		Angle (B)
	111.		P.C.board angle
	112.		Switch angle
	113.		PCB spacer
	114.		P plate holder
	115.		Subcode board assembly
	116.		Remote sensor unit holder
	117.		Mounte plate

6.2 Mechanism assembly


A
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Servo Mechanism Section
Parts List

Mark	No.	Part No.	Description
	1.	PWY-007	Pick up assembly
	2.	PNY-592	Mechanism chassis
	3.	PNY-595	Disc table
	4.	PNY-596	Spring holder
	5.	PNY-597	Clamp lever
	6.	PNY-611	Flexible holder
	7.	PNY-593	Clamper holder
	8.	PBH-468	Clamp spring
	9.	PBP-006	Steel ball ϕ3
★★	10.	PEB-342	Belt (CARRIAGE)
	11.	PLB-294	Guide bar
	12.	PNP-394	Switch P.C. board
★★	13.	PNY-499	Pulley
★★	14.	PSH-019	Slide switch
★★	15.	PXM-154	Spindle motor
	16.	VNL-268	Receptacle
	17.	BBZ30P060FMC	Screw
	18.	....	....
	19.	IPZ30P080FMC	Screw
	20.	PBA-213	Drive screw
	21.	PMZ20P030FMC	Screw
	22.	PMA20P040FMC	Screw
	23.	PNY-612	Drive nut
	24.	PBA-188	Float screw
	25.	PBP-007	Steel ball ϕ5
	26.	PEB-316	Float rubber
★★	27.	PEB-343	Belt (LOADING)
	28.	PEB-344	Rubber cushion (A)
	29.	PEB-345	Rubber cushion (B)
	30.	PEB-347	Float rubber
	31.	PEC-108	Binder
	32.	PNY-602	Pulley C
	33.	PNY-603	Gear pulley
	34.	PNY-604	Gear
	35.	PNY-605	Rack
	36.	PNY-606	Retainer
	37.	PNY-607	Tray
	38.	PNY-608	Plate
	39.	PNY-609	Belt cam
★★	40.	PSN-006	Leaf switch
	41.	BBZ30P060FZK	Screw
	42.	PBA-214	Screw
	43.	PBZ26P060FZK	Screw
	44.	PBZ30P060FZK	Screw
	45.	WT16D035D025	Washer
	46.	WT25D047D25	Washer
	47.	PPZ30P080FMC	Screw
	48.	....	....
	49.	....	....
	50.	PEC-107	Binder
	51.	PBA-205	Screw
	52.	BCZ30P080FUC	Screw
	53.	PBH-455	PU Spring
	54.	PNY-562	PU Cum
★★	55.	PYY-513	Motor assembly (CARRIAGE)
★★	56.	PYY-514	Motor assembly (LOADING)
	57.	PBH0001	Clamp spring
	58.	PNW1015	Clamper
	101.		Guide bar retainer
	102.		Cushion
	103.		Motor pulley
	104.		Motor holder
	105.		Servo mechanism assembly
	106.		Disc cushion
	107.		Motor (CARRIAGE)
	108.		Disc sheet
	109.		Push plate
	110.		Stopper rubber
	111.		Motor pulley
	112.		Rail cover
	113.		Rail R
	114.		Motor (LOADING)
	115.		Loading base unit
	116.		Slide base unit
	117.		PU Angle

External Appearance of Transistors and ICs

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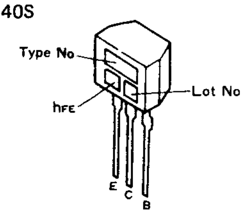
2SC1740S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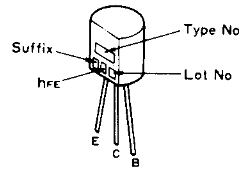
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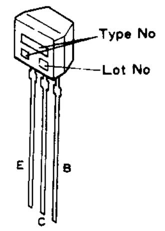
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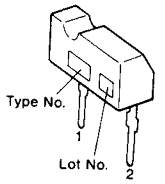
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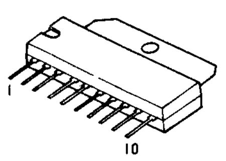

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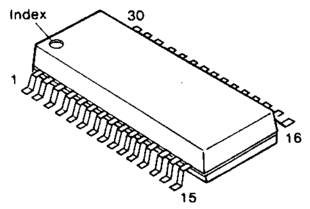
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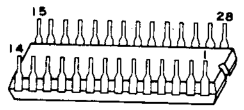

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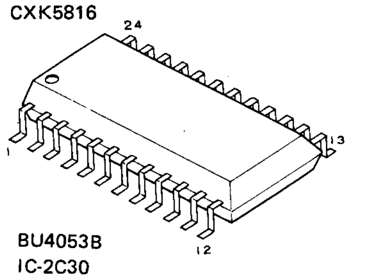

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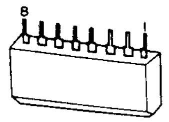

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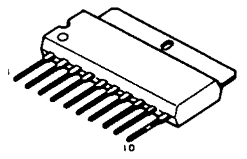

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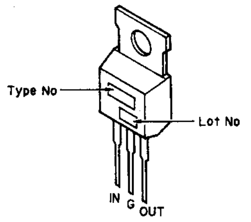
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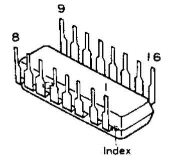

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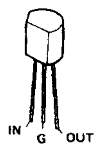

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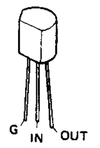

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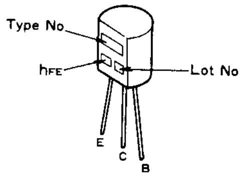
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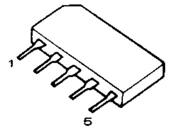

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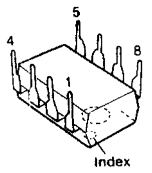

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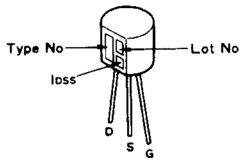
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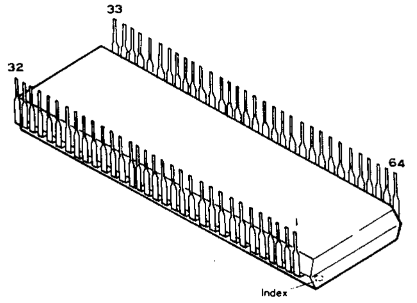
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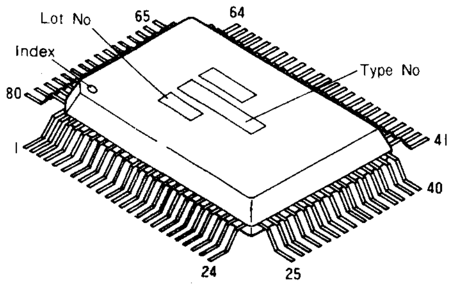
CX23035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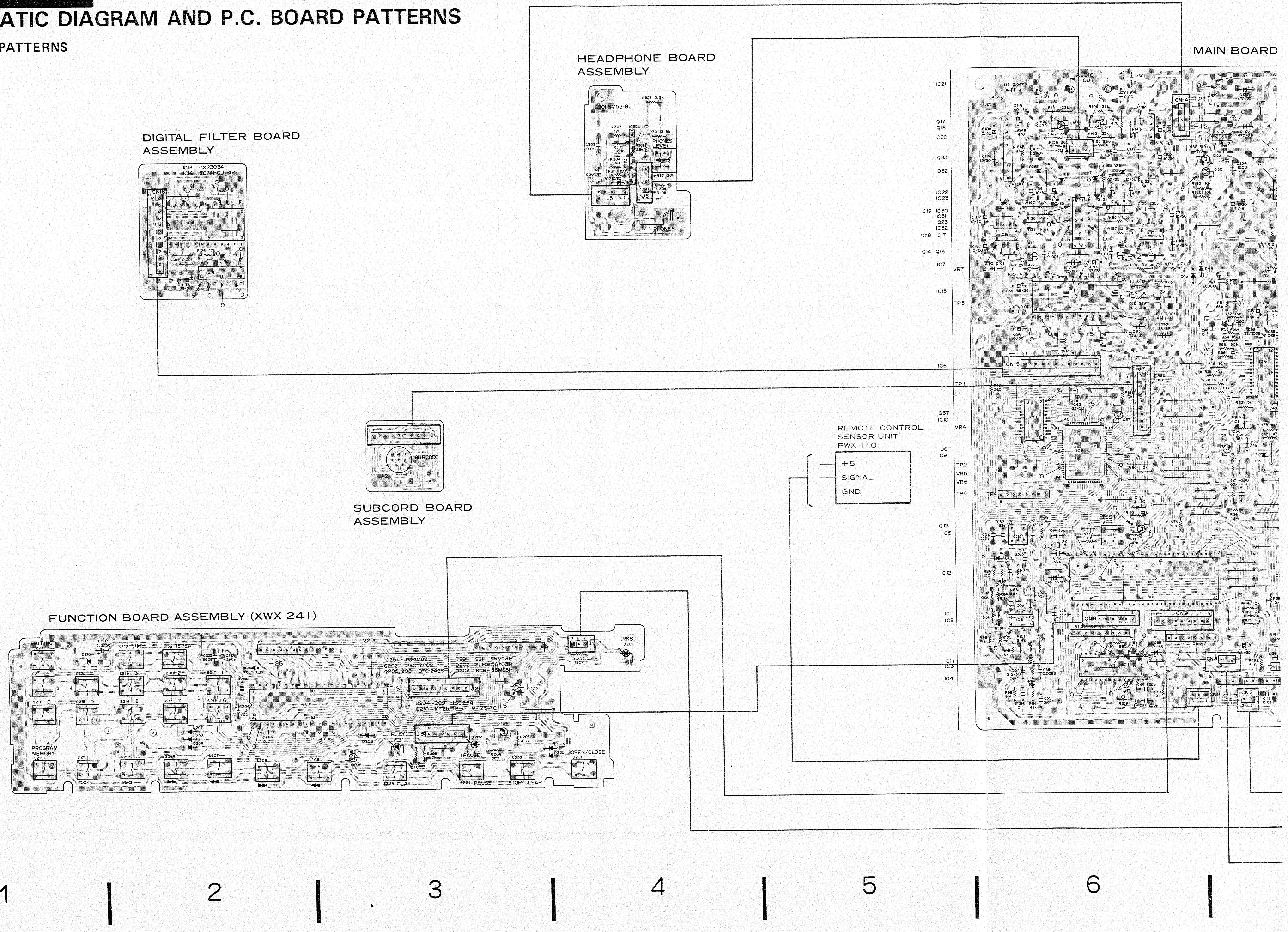
7. SCHEMATIC DIAGRAM AND P.C. BOARD PATTERNS

7.1 P.C. BOARD PATTERNS


2
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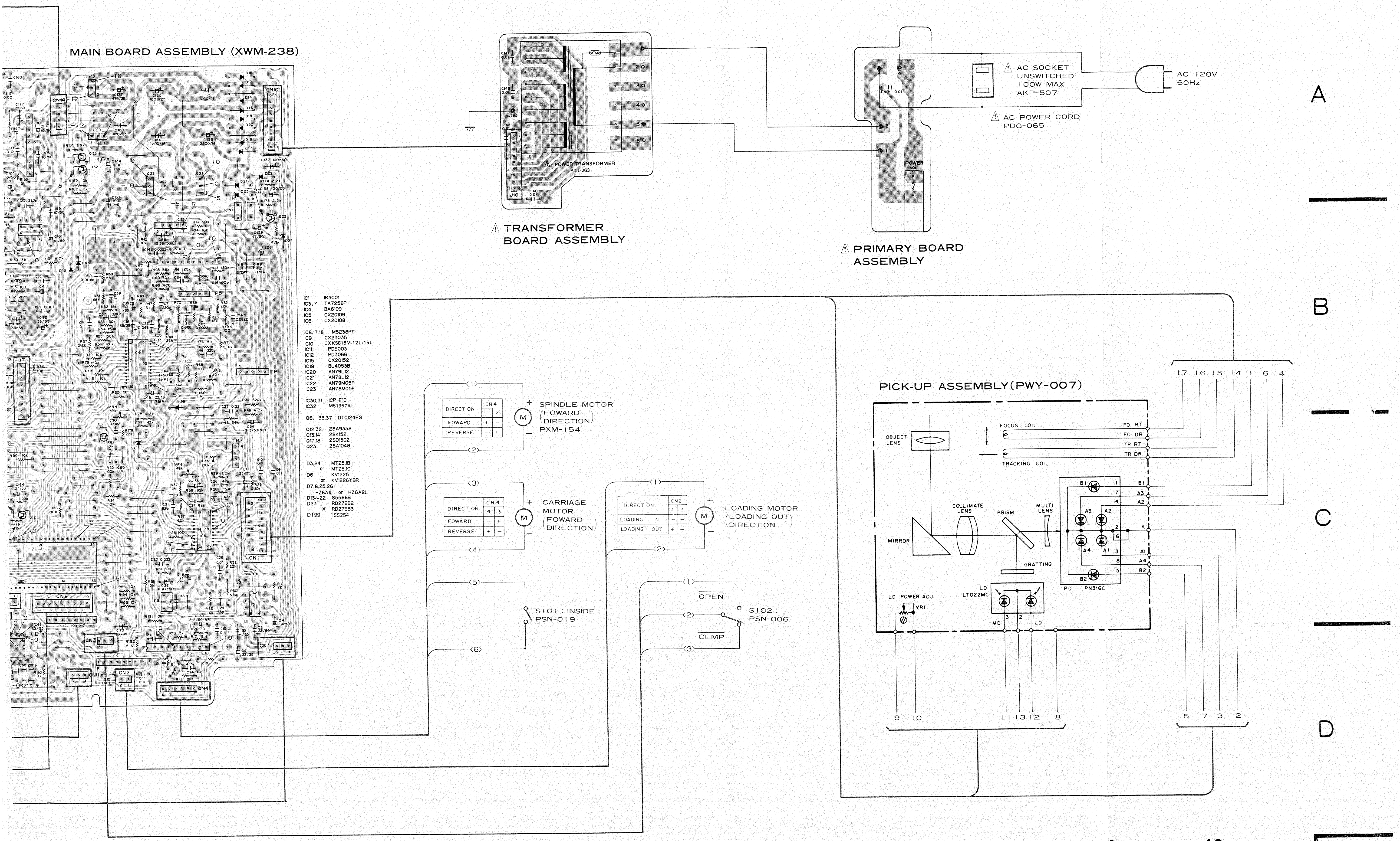
6
HEADPHONE BOARD ASSEMBLY
IC301 M5218L
PHONES LEVEL
PHONES
J5
J6
MAIN BOARD
AUDIO OUT
CN14
CN15
CN8
CN9
CN3
CN2
TEST
DIGITAL FILTER BOARD ASSEMBLY
IC13 CX23034
IC14 TC74HCU04P
CN16
SUBCODE
JA2
J7
SUBCORD BOARD ASSEMBLY
REMOTE CONTROL SENSOR UNIT PWX-110
+5
SIGNAL
GND
FUNCTION BOARD ASSEMBLY (XWX-241)
EDITING
TIME
REPEAT
V201
IC201 PD4063
Q202 2SC1740S
Q205,206 DTC124ES
D201 SLH-56VC3H
D202 SLH-56YC3H
D203 SLH-56MC3H
D204~209 1SS254
D210 MTZ5.1B or MTZ5.1C
(RKS)
PROGRAM MEMORY
(PLAY)
(PAUSE)
S204 PLAY
S203 PAUSE
STOP/CLEAR
OPEN/CLOSE
J2
J3



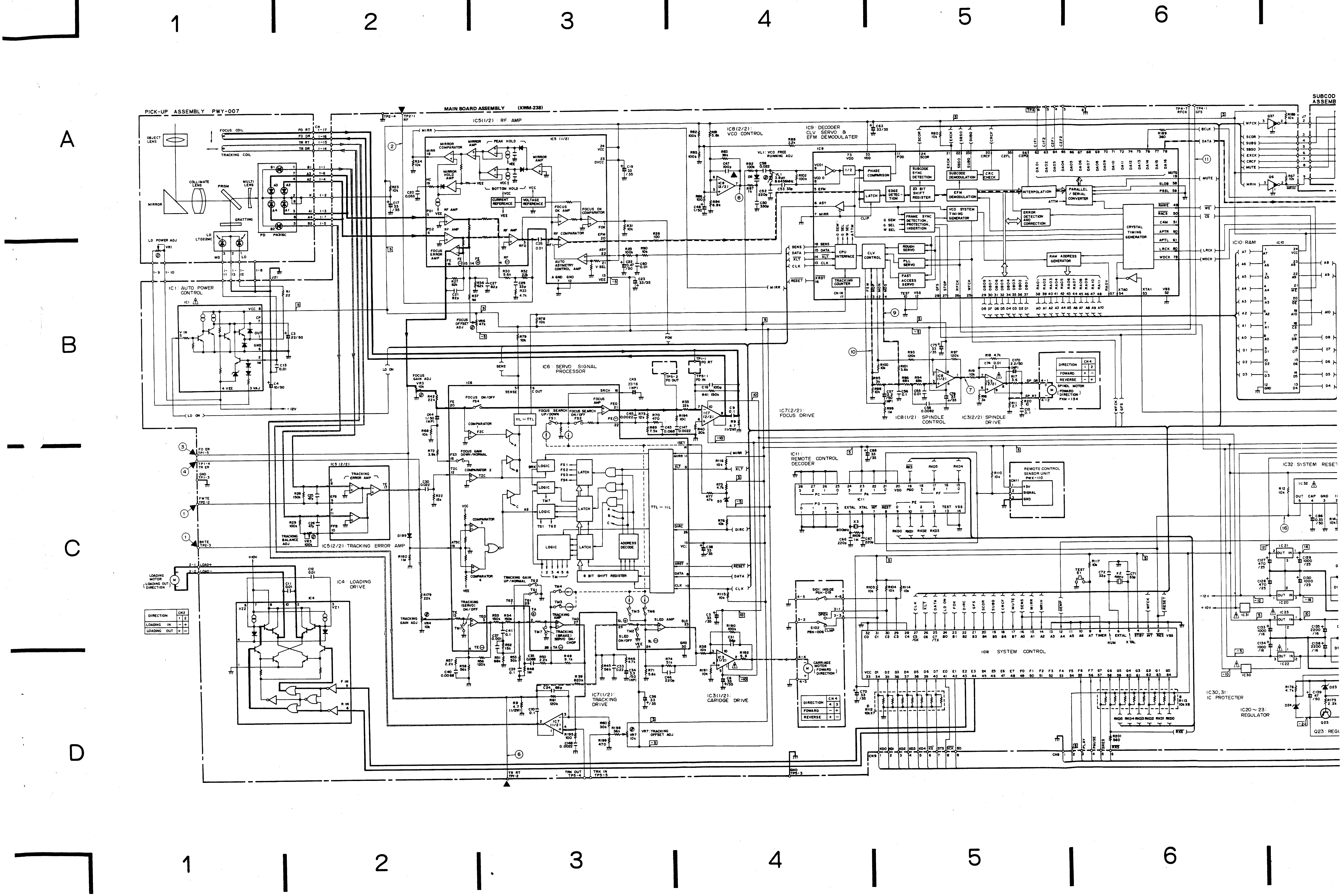
MAIN BOARD ASSEMBLY (XWM-238)
CN14
CN10
CN1
CN3
CN9
CN5
CN11
CN2
CN4
TP1
TP2
TP5
TRANSFORMER BOARD ASSEMBLY
POWER TRANSFORMER PTT-263
J10
PT
C141 0.01
C143 0.01
C142 0.01
C140 0.01
PRIMARY BOARD ASSEMBLY
C401 0.01
POWER S401
AC SOCKET UNSWITCHED 100W MAX AKP-507
AC POWER CORD PDG-065
AC 120V 60Hz
SPINDLE MOTOR (FOWARD DIRECTION) PXM-154
CARRIAGE MOTOR (FOWARD DIRECTION)
LOADING MOTOR (LOADING OUT DIRECTION)
M
S101 : INSIDE PSN-019
S102 : PSN-006
OPEN
CLMP
PICK-UP ASSEMBLY(PWY-007)
OBJECT LENS
FOCUS COIL
TRACKING COIL
FO RT
FO DR
TR RT
TR DR
MIRROR
COLLIMATE LENS
PRISM
MULTI LENS
GRATTING
LD LT022MC
MD
LD
LD POWER ADJ
VR1
PD PN316C
B1
B2
A1
A2
A3
A4
K
17 16 15 14 1 6 4
9 10 11 13 12 8
5 7 3 2

IC1	IR3C01
IC3, 7	TA7256P
IC4	BA6109
IC5	CX20109
IC6	CX20108
IC8,17,18	M5238PF
IC9	CX23035
IC10	CXK5816M-12L/15L
IC11	PDE003
IC12	PD3066
IC15	CX20152
IC19	BU4053B
IC20	AN79L12
IC21	AN78L12
IC22	AN79M05F
IC23	AN78M05F
IC30,31	ICP-F10
IC32	M51957AL
Q6, 33,37	DTC124ES
Q12,32	2SA933S
Q13,14	2SK152
Q17,18	2SD1302
Q23	2SA1048
D3,24	MTZ5.1B or MTZ5.1C
D6	KV1225 or KV1226YBR
D7,8,25,26	HZ6A1L or HZ6A2L
D13~22	S5566B
D23	RD27EB2 or RD27EB3
D199	1SS254

DIRECTION	CN4	
	1	2
FOWARD	+	−
REVERSE	−	+

DIRECTION	CN4	
	4	3
FOWARD	−	+
REVERSE	+	−

DIRECTION	CN2	
	1	2
LOADING IN	−	+
LOADING OUT	+	−


1
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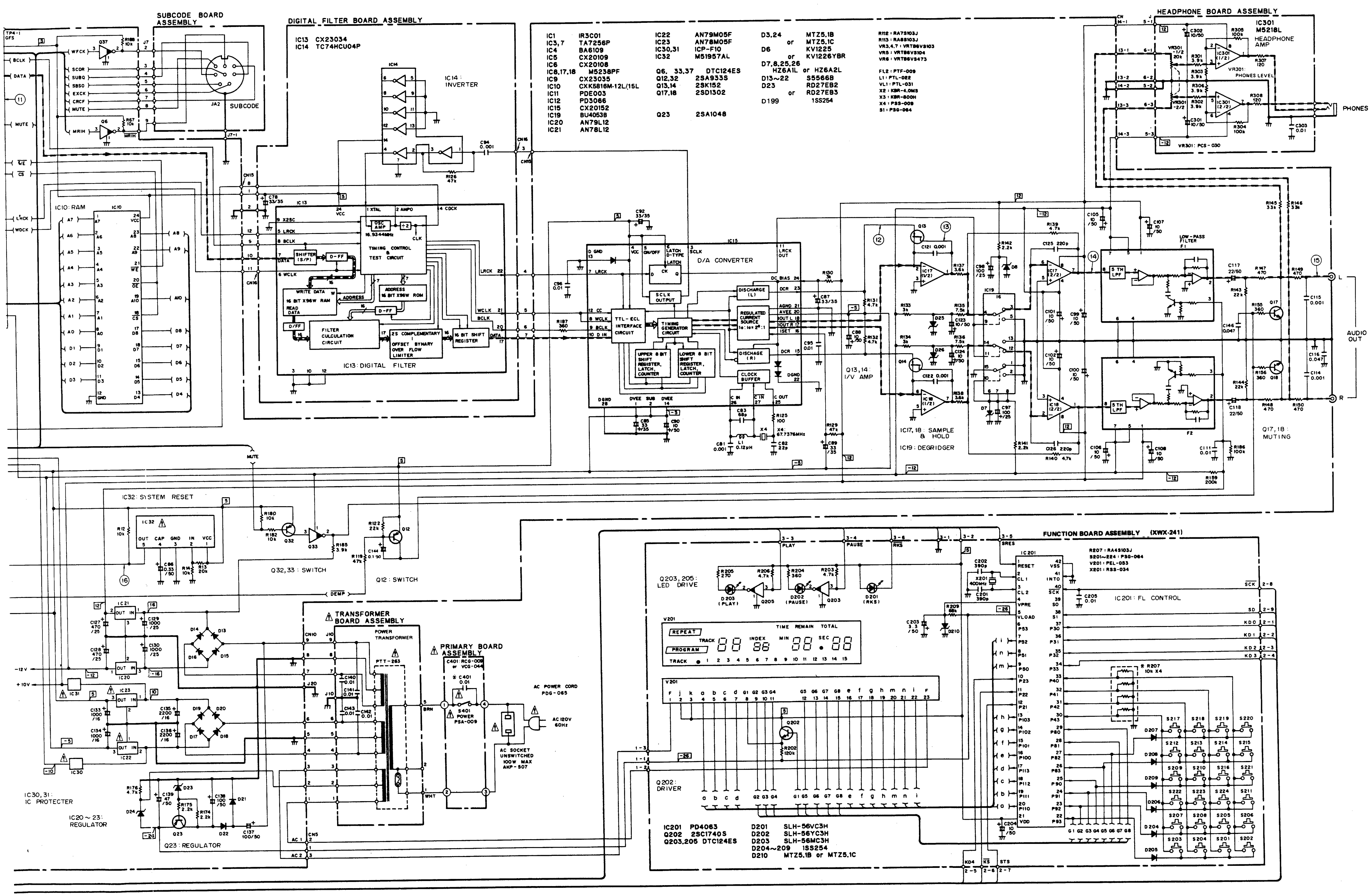
A
B
C
D
PICK-UP ASSEMBLY PWY-007
MAIN BOARD ASSEMBLY (XWM-238)
SUBCODE ASSEMB
OBJECT LENS
FOCUS COIL
TRACKING COIL
COLLIMATE LENS
PRISM
MULTI LENS
MIRROR
GRATTING
LD LT022MC
PD PN316C
LD POWER ADJ
IC1: AUTO POWER CONTROL
IC5(1/2): RF AMP
MIRROR COMPARATOR
MIRROR AMP
PEAK HOLD
BOTTOM HOLD
MIRROR HOLD AMP
CURRENT REFERENCE
VOLTAGE REFERENCE
FOCUS OK AMP
FOCUS OK COMPARATOR
RF COMPARATOR
AUTO ASYMMETRY CONTROL AMP
FOCUS ERROR AMP
FOCUS OFFSET ADJ
IC8(2/2): VCO CONTROL
VL1: VCO FREE RUNNING ADJ
IC9: DECODER CLV SERVO & EFM DEMODULATER
PHASE COMPARISON
EDGE DETECTION
LATCH
23 BIT SHIFT REGISTER
EFM DEMODULATION
SUBCODE SYNC DETECTION
SUBCODE DEMODULATION
CRC CHECK
FRAME SYNC DETECTION, PROTECTION, INSERTION
VCO SYSTEM TIMING GENERATOR
ERROR DETECTION AND CORRECTION
INTERPOLATION
PARALLEL / SERIAL CONVERTER
CRYSTAL TIMING GENERATOR
CPU INTERFACE
CLV CONTROL
ROUGH SERVO
PLL SERVO
FAST ACCESS SERVO
TRACKING COUNTER
RAM ADDRESS GENERATOR
IC10: RAM
IC6: SERVO SIGNAL PROCESSOR
FOCUS GAIN ADJ
FOCUS ON/OFF
FOCUS SEARCH UP/DOWN
FOCUS SEARCH ON/OFF
FOCUS AMP
COMPARATOR
FOCUS GAIN DOWN/NORMAL
IIL-TTL
TTL-IIL
LOGIC
LATCH
ADDRESS DECODE
8 BIT SHIFT REGISTER
TRACKING GAIN UP/NORMAL
TRACKING (SERVO) ON/OFF
TRACKING AMP
TRACKING (BRAKE) SERVO ON/CHOP
SLED ON/OFF
SLED AMP
IC7(2/2): FOCUS DRIVE
IC8(1/2): SPINDLE CONTROL
IC3(2/2): SPINDLE DRIVE
SPINDLE MOTOR PXM-154
DIRECTION
FOWARD
REVERSE
IC5(2/2): TRACKING ERROR AMP
TRACKING ERROR AMP
TRACKING BALANCE ADJ
IC4: LOADING DRIVE
LOADING MOTOR
LOADING IN
LOADING OUT
IC7(1/2): TRACKING DRIVE
VR7: TRACKING OFFSET ADJ
IC3(1/2): CARIDGE DRIVE
CARRIAGE MOTOR
S101: INSIDE PSH-019
S102: PSH-006
IC11: REMOTE CONTROL DECODER
REMOTE CONTROL SENSOR UNIT PWX-110
IC12 SYSTEM CONTROL
IC32: SYSTEM RESET
IC30, 31: IC PROTECTER
IC20~23: REGULATOR
Q23: REGU
TEST S1
TR RT TP1-2
TRK OUT TP5-4
TRK IN TP5-5
GND TP5-3
CN8
CN9


7
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10
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12
A
B
C
D
SUBCODE BOARD ASSEMBLY
SUBCODE
DIGITAL FILTER BOARD ASSEMBLY
IC13 CX23034
IC14 TC74HCU04P
IC14 : INVERTER
IC10 : RAM
IC13 : DIGITAL FILTER
OSC AMP
TIMING CONTROL & TEST CIRCUIT
SHIFTER (S/P)
16 BIT X96W RAM
16 BIT X96W ROM
FILTER CALCULATION CIRCUIT
2S COMPLEMENTARY OFFSET BINARY OVER FLOW LIMITER
16 BIT SHIFT REGISTER
D/A CONVERTER
TTL - ECL INTERFACE CIRCUIT
TIMING GENERATOR CIRCUIT
UPPER 8 BIT SHIFT REGISTER, LATCH, COUNTER
LOWER 8 BIT SHIFT REGISTER, LATCH, COUNTER
REGULATED CURRENT SOURCE
DISCHARGE (L)
DISCHARGE (R)
CLOCK BUFFER
X4 67.7376MHz
IC1 IR3C01
IC3,7 TA7256P
IC4 BA6109
IC5 CX20109
IC6 CX20108
IC8,17,18 M5238PF
IC9 CX23035
IC10 CXK5816M-12L/15L
IC11 PDE003
IC12 PD3066
IC15 CX20152
IC19 BU4053B
IC20 AN79L12
IC21 AN78L12
IC22 AN79M05F
IC23 AN78M05F
IC30,31 ICP-F10
IC32 M51957AL
Q6, 33,37 DTC124ES
Q12,32 2SA933S
Q13,14 2SK152
Q17,18 2SD1302
Q23 2SA1048
D3,24 MTZ5.1B or MTZ5.1C
D6 KV1225 or KV1226YBR
D7,8,25,26 HZ6A1L or HZ6A2L
D13~22 S5566B
D23 RD27EB2 or RD27EB3
D199 1SS254
R112 : RA7S103J
R113 : RA8S103J
VR3,4,7 : VRTB6VS103
VR5 : VRTB6VS104
VR6 : VRTB6VS473
F1,2 : PTF-009
L1 : PTL-022
VL1 : PTL-031
X2 : KBR-4.0MS
X3 : KBR-800H
X4 : PSS-009
S1 : PSG-064
HEADPHONE BOARD ASSEMBLY
IC301 M5218L
HEADPHONE AMP
VR301 : PCS-030
PHONES LEVEL
PHONES
Q13,14 : I/V AMP
IC17,18 SAMPLE & HOLD
IC19 : DEGRIDGER
LOW-PASS FILTER F1
F2
AUDIO OUT
L
R
Q17,18 : MUTING
MUTE
IC32 : SYSTEM RESET
Q32,33 : SWITCH
Q12 : SWITCH
DEMP
TRANSFORMER BOARD ASSEMBLY
POWER TRANSFORMER
PTT-263
PRIMARY BOARD ASSEMBLY
C401: RCG-009 or VCG-044
S401 POWER PSA-009
AC POWER CORD PDG-065
AC 120V 60Hz
AC SOCKET UNSWITCHED 100W MAX AKP-507
IC30,31 : IC PROTECTER
IC20 ~ 23 : REGULATOR
Q23 : REGULATOR
FUNCTION BOARD ASSEMBLY (XWX-241)
R207 : RA4S103J
S201~224 : PSG-064
V201 : PEL-053
X201 : RSS-034
IC201 : FL CONTROL
Q203, 205 : LED DRIVE
D203 (PLAY)
D202 (PAUSE)
D201 (RKS)
PLAY
PAUSE
RKS
SRES
V201
REPEAT
PROGRAM
TRACK
INDEX
TIME REMAIN TOTAL
MIN
SEC
Q202 : DRIVER
IC201 PD4063
Q202 2SC1740S
Q203,205 DTC124ES
D201 SLH-56VC3H
D202 SLH-56YC3H
D203 SLH-56MC3H
D204~209 1SS254
D210 MTZ5.1B or MTZ5.1C

1. RESISTORS.
Indicated in Ω, ¼W, ⅛W, ±5% tolerance unless otherwise noted k; kΩ, M; MΩ, (F); ±1%, (G); ±2%, (K); ±10%, (M); ±20% tolerance

2. CAPACITORS:
Indicated in capacity (μF)/voltage (V) unless otherwise noted p; pF. Indication without voltage is 50V except electrolytic capacitor.

3. VOLTAGE CURRENT.
▭ ; DC voltage (V) at no input signal

4. OTHERS:
➡ ; Signal route.
⊘ ; Adjusting point.
The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
※ marked capacitors and resistors have parts numbers.

This is the basic schematic diagram, but the actual circuit may vary due to improvements in design.

The waveforms at each measuring point indicated by the encircled numbers are given on pages thru

SWITCHES:
MAIN BOARD ASSEMBLY
S1 : TEST
FUNCTION BOARD ASSEMBLY
S201 : OPEN / CLOSE
S202 : STOP / CLEAR
S203 : PAUSE
S204 : PLAY
S205 : TRACK SEARCH (⏮)
S206 : TRACK SEARCH (⏭)
S207 : MANUAL SEARCH (◀◀)
S208 : MANUAL SEARCH (▶▶)
S209 : INDEX SEARCH (⏮)
S210 : INDEX SEARCH (⏭)
S211 : PROGRAM MEMORY
S212 : 6
S213 : 7
S214 : 8
S215 : 9
S216 : 0
S217 : 1
S218 : 2
S219 : 3
S220 : 4
S221 : 5
S222 : TIME
S223 : EDITING
S224 : REPEAT
PRIMARY BOARD ASSEMBLY
S401 : POWER ON - OFF
OUTSIDE OF P.C. BOARD ASSEMBLY
S101 : INSIDE
S102 : CLAMP CLAMP - OPEN

The underlined indicates the switch position.

——— Focus servo loop line
- - - - Signal route

——— Tracking servo loop line
- - - - Carriage servo line

——— Loading motor route
- - - - Spindle motor route

▶ Measurement point

7.2 SCHEMATIC DIAGRAM

NOTE:

1. RESISTORS.
   Indicated in Ω, ¼W, ⅛W,±5% tolerance unless otherwise noted k; kΩ, M; MΩ, (F); ±1%, (G); ±2%, (K); ±10%, (M); ±20% tolerance
2. CAPACITORS:
   Indicated in capacity (μF)/voltage (V) unless otherwise noted p; pF. Indication without voltage is 50V except electrolytic capacitor.
3. VOLTAGE
   ▭ ; DC voltage (V) at no input signal
4. OTHERS:
   ➡ ; Signal route.
   ⊘ ; Adjusting point.
   The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
   ✱ marked capacitors and resistors have parts numbers.

This is the basic schematic diagram, but the actual circuit may vary due to improvements in design.

The waveforms at each measuring point indicated by the encircled numbers are given on pages 31 thru 34.

SWITCHES:
MAIN BOARD ASSEMBLY
S1 : TEST
FUNCTION BOARD ASSEMBLY
S201 : OPEN / CLOSE
S202 : REPEAT
S203 : ◀◀ (MANUAL SEARCH)
S204 : ▶▶ (MANUAL SEARCH)
S205 : PROGRAM
S206 : ⏮ (TRACK SEARCH)
S207 : ⏭ (TRACK SEARCH)
S208 : STOP / CLEAR
S209 : PLAY
S210 : PAUSE
PRIMARY BOARD ASSEMBLY
S401 : POWER ON – OFF
OUTSIDE OF P.C. BOARD ASSEMBLY
S101 : INSIDE
S102 : CLAMP CLAMP – OPEN

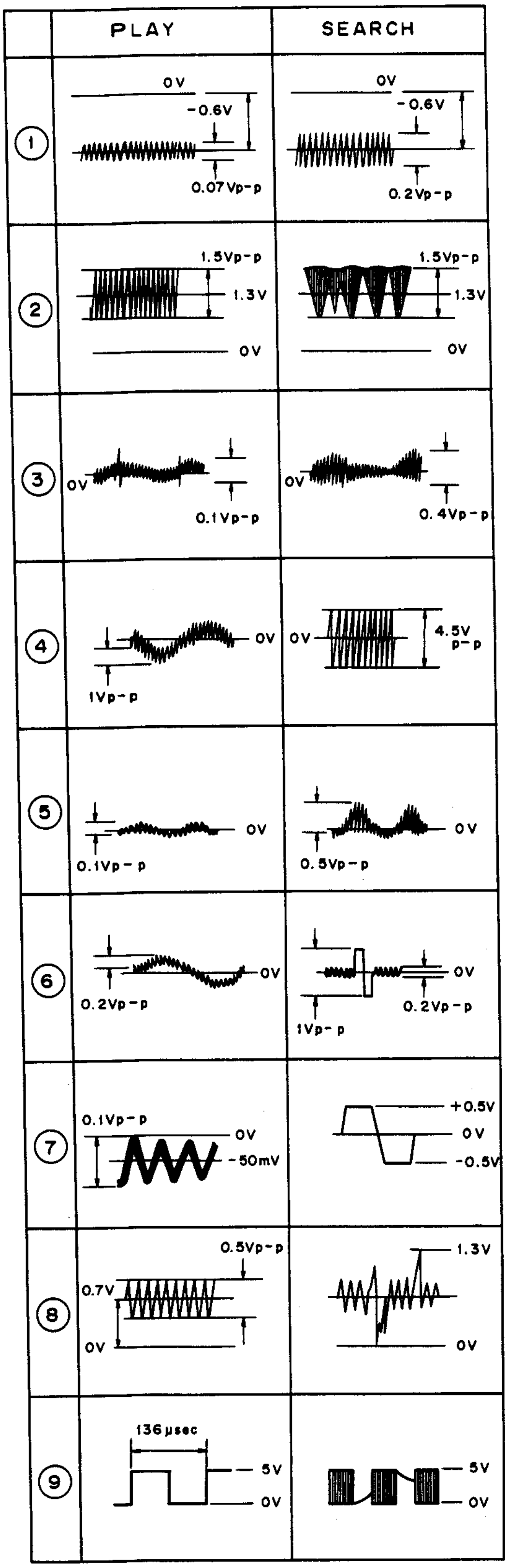
The underlined indicates the switch position.

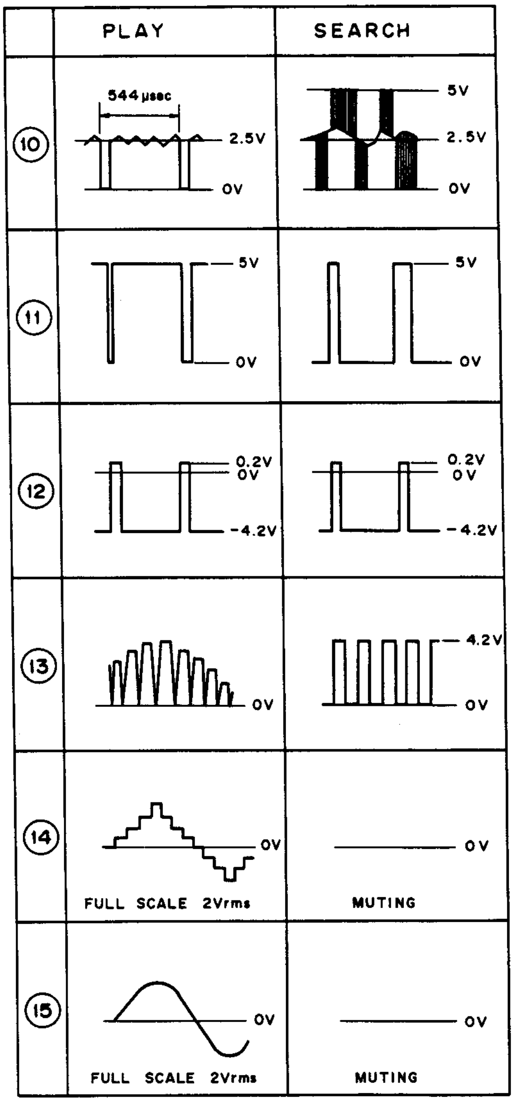
————————	**Focus servo loop line**
– – – – – – – – – – –	**Signal route**
————————	Tracking servo loop line
– – – – – – – – – – –	Carriage servo line
————————	**Loading motor route**
– – – – – – – – – – –	**Spindle motor route**
▶	**Measurement point**

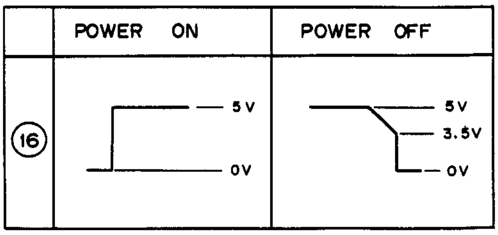
• List of Symbols

Symbol	Signal Source	Signal Name	Function
B1			Tracking signal lead code detector
A0~A10	IC9-38~48	Address line	
APCG	IC1-6	APC GND	
A1 ~ A4			Output from 1/4 divider detectors used to detect RF and focus signals
BCLK	IC9-76	Bit clock	
B2			Tracking signal end code detector
C·OUT	IC6-6	Counter out	Track count signal pulse
C1F1	IC9-62	Error flag	Flags indicating when decoder LSI is correcting errors
C1F2	IC9-63	Error flag	
C2F1	IC9-64	Error flag	
C2F2	IC9-65	Error flag	
CA·DR	IC3-2	Carriage drive	Carriage motor drive output
CLK	IC12-27	Clock	IC6 and IC9 control data (serial) clock
$\overline{\text{CLMP}}$	S102	Clamp	Disc tray status (L: closed, H: open or moving)
CRCF	IC9-20		Sub-code Q error detection result output (synchronized with SCOR signal)
$\overline{\text{CS}}$	IC9-50	Chip select	RAM activator control signal
D1~D8	IC9-37~34 32~29	Data line	RAM data line
DATA	IC9-78	Data	DAC playback signal data (serial)
$\overline{\text{DEMP}}$	IC12-12	De-emphasis	De-emphasis on/off signal (L: de-emphasis ON)
DIRC	IC12-22	Direct	Control signal involved in single track jumping (control only while signal is at L level)
EXCK	IC9-21	External clock	External clock input
$\overline{\text{FG DW}}$	IC12-15	Focus gain down	Control signal for reducing focus servo gain
FO·DR	IC7-8	Focus drive	Focus actuator drive signal
FO·ER	IC5-16	Focus error	Focus error signal
FO·IN	TP5-1	Focus loop in	Focus servo gain adjustment input
FO·OT	TP5-2	Focus loop out	Focus servo gain adjustment output
FO·RT	TP1-1	Focus return	Focus actuator drive current detector
FOK	IC5-1	Focus OK	H level output to indicate that "in focus" status is set when RF signal is obtained
GFS	IC9-28	GFS	Frame sync lock status output (H: locked)
GND		GND	
$\overline{\text{INSD}}$	S101	Inside	Detector signal indicating that pick-up has reached inside track
K			
KD0~KD5	IC11 9~12 15, 17	Key data	Key on/off matrix encoded data
L·IN	IC12-43	Loading in	Loading-in control signal
L·OUT	IC12-44	Loading out	Loading-out control signal
LD ON	IC12-24	Laser diode	Laser diode switching signal (H: diode ON)
LOAD +	IC4-2		Loading motor drive voltage output
LOAD –	IC4-10		
LRCK	IC9-80	LR clock	Clock for switching decoder (DAC) left/right channels

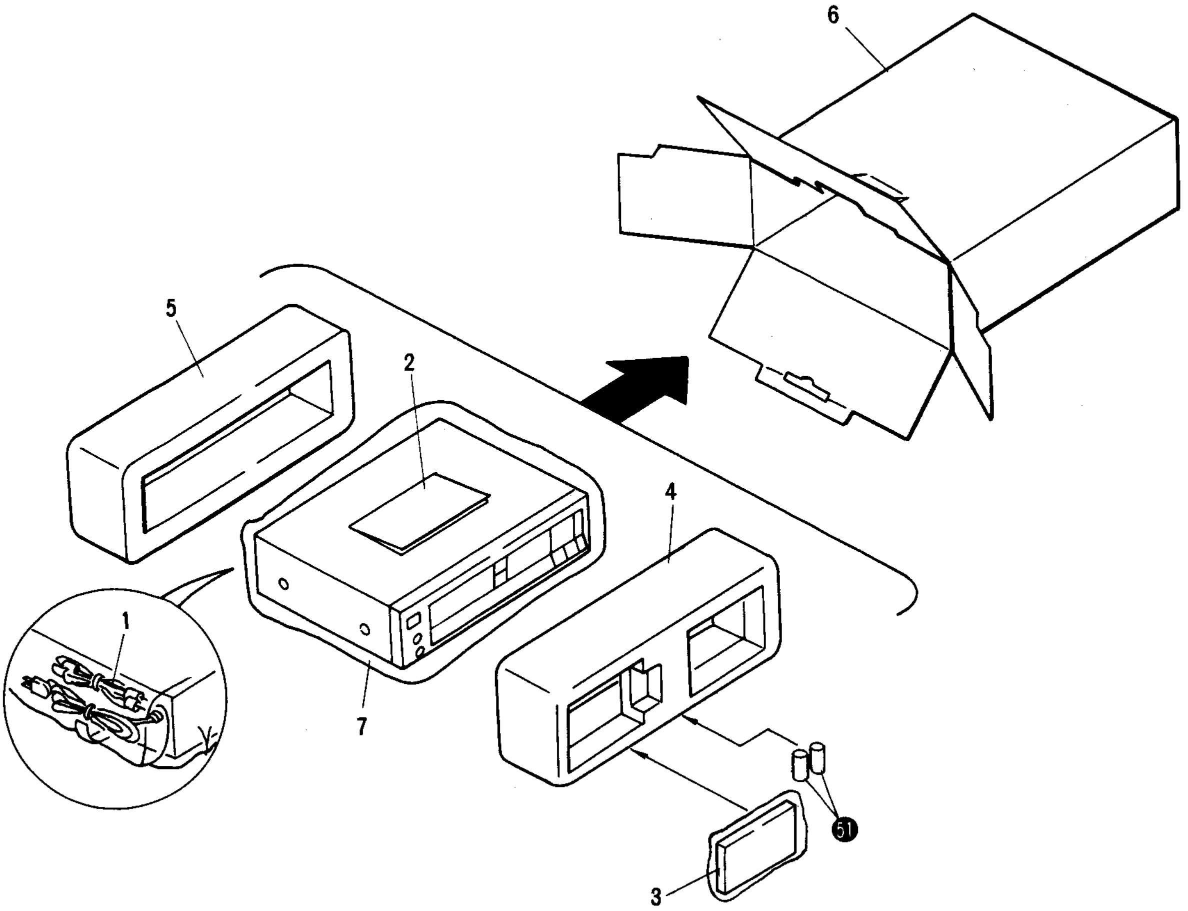
Symbol	Signal Source	Signal Name	Function
MIRR	IC5-18	Mirror	Pitless side (mirror surface) detector signal (pitless side:H)
MRIH	IC12-14	Mirror inhibit	Control signal which inhibits transfer of MIRR signal from IC5 to IC9
MUTE	IC12-17	Muting	IC9 digital mute control signal
OPEN	S102	Open	Output from switch which detects when disc tray is open (open: L)
RAOV	IC9-57	RAM overflow	Output signal generated when RAM area overflow occurs (overflow: H)
RESET	IC32-5	Reset	Power ON reset signal
RFCK	TP4-7 (IC9, 25)	Read frame clock	Standard frame clock signal (7.35kHz)
RKS	IC12-58	Remote control key	Remote control key strobe passed from remote control decoder (IC11) to main microprocessor (IC12)
S8SO	IC9-22		Sub-code serial output
SCOR	IC9-24		Sub-code sync
SENS	IC6-5		Detector output bus from IC6 & IC9
SP•DR	CN4-1	Spindle drive	Spindle motor drive output
SP•RT	CN4-2	Spindle return	Spindle motor drive current detector
SRES	IC12-57	Serial reset	Key/display/microprocessor reset signal
SUBO	IC9-23	Sub-code Q	Sub-code Q output (address and other data)
TR•DR	IC7-2	Tracking drive	Tracking actuator drive signal
TR•ER	IC5-17	Tracking error	Tracking servo error output
TR•IN	TP5-5	Tracking loop in	Tracking servo gain adjustment input
TR•OT	TP5-4	Tracking loop out	Tracking servo gain adjustment output
TR•RT	TP1-2	Tracking return	Tracking actuator drive current detector
WCLK	IC13-21		Digital filter 88.2kHz strobe signal input
WDCK	IC9-79		Digital filter 88.2kHz strobe signal output
$\overline{\text{WE}}$	IC9-49	Write enable	RAM write enable
WFCK	IC9-25	Write from clock	Frame clock signal made from data (frame sync. lock: 7.35kHz)
$\overline{\text{XLT}}$	IC12-26		Servo and decode IC serial data latch clock pulase signal


PLAY
SEARCH
①
0V
-0.6V
0.07Vp-p
0V
-0.6V
0.2Vp-p
②
1.5Vp-p
1.3V
0V
1.5Vp-p
1.3V
0V
③
0V
0.1Vp-p
0V
0.4Vp-p
④
0V
1Vp-p
0V
4.5V p-p
⑤
0V
0.1Vp-p
0V
0.5Vp-p
⑥
0V
0.2Vp-p
0V
1Vp-p
0.2Vp-p
⑦
0.1Vp-p
0V
-50mV
+0.5V
0V
-0.5V
⑧
0.5Vp-p
0.7V
0V
1.3V
0V
⑨
136µsec
5V
0V
5V
0V


PLAY
SEARCH
⑩
544µsec
2.5V
0V
5V
2.5V
0V
⑪
5V
0V
5V
0V
⑫
0.2V
0V
-4.2V
0.2V
0V
-4.2V
⑬
0V
4.2V
0V
⑭
0V
FULL SCALE 2Vrms
0V
MUTING
⑮
0V
FULL SCALE 2Vrms
0V
MUTING


POWER ON
POWER OFF
⑯
5V
0V
5V
3.5V
0V

8. PACKING



Parts List of Packing

Mark	No.	Part No.	Description
	1.	PDE-321	Connection cord
	2.	PRB-311	Operating instructions
	3.	PWW-011	Remote control unit
	4.	PHA-215	Protector (F)
	5.	PHA-216	Protector (R)
	6.	PHH-358	Packing case
	7.	Z22-006	Polyethylene sheet
	51.		Battery

9. ELECTRICAL PARTS LIST

NOTES:

- *When ordering resistors, first convert resistance values into code form as shown in the following examples.*

  Ex. 1 When there are 2 effective digits (any digit apart from 0), such as 560 ohm and 47k ohm (tolerance is shown by J = 5%, and K = 10%).

  560Ω 56×10^1 561........................RD1/4PS 5 6 1 J
  47kΩ 47×10^3 473........................RD1/4PS 4 7 3 J
  0.5Ω 0R5..RN2H 0 R 5 K
  1Ω 010..RS1P 0 1 0 K

  Ex. 2 When there are 3 effective digits (such as in high precision metal film resistors).
  5.62kΩ 562×10^1 5621.....................RN1/4SR 5 6 2 1 F
- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
- *For your parts Stock Control, the fast moving items are indicated with the marks ★★ and ★.*
  ★★ GENERALLY MOVES FASTER THAN ★
  This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.
- *Parts marked by "●" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.*

MISCELLANEOUS PARTS

Mark	Symbol & Description	Part No.
⚠ ●	Main board assembly	XWM-238
⚠ ●	Function board assembly	XWX-241
	Primary board assembly	Non supply
	Transformer board assembly	Non supply
	Headphone board assembly	Non supply
	Digital filter board assembly	Non supply
	Subcode board assembly	Non supply
⚠	AC socket (1PAC OUTLET)	AKP-507
⚠	Strain relief	CM-22
⚠	AC power cord	PDG-065
★★	Slide switch (INSIDE, S101)	PSH-019
	Remote control unit	PWW-011
	Remote control sensor unit	PWX-110
★★	Spindle motor	PXM-154
★★	Leaf switch (TRAY, S102)	PSN-006
★★	Motor assembly (CARRIAGE)	PYY-513
★★	Motor assembly (LOADING)	PYY-514

● Main Board Assembly (XWM-238)

SEMICONDUCTORS

Mark	Symbol & Description	Part No.
★★	IC21	AN78L12
⚠ ★★	IC23	AN78M05F
★★	IC20	AN79L12
⚠ ★★	IC22	AN79M05F
★★	IC4	BA6109
★★	IC19	BU4053B
★★	IC6	CX20108
★★	IC5	CX20109
★★	IC15	CX20152
★★	IC9	CX23035
★★	IC10	CXK5816M-12L/15L
⚠ ★★	IC30, IC31	ICP-F10
⚠ ★★	IC1	IR3C01
⚠ ★★	IC32	M51957AL
★★	IC8, IC17, IC18	M5238PF
★★	IC11	PDE003
★★	IC12	PD3066
⚠ ★★	IC3, IC7	TA7256P
★★	Q6, Q33, Q37	DTC124ES
★★	Q12, Q32	2SA933S
★★	Q17, Q18	2SD1302
★★	Q13, Q14	2SK152
★★	Q23	2SA1048
★	D7, D8, D25, D26	HZ6A1L/2L
★	D6	KV1225/1226YBR
★	D3, D24	MTZ5.1B/C (RD5.1EB2/B3)
★	D23	RD27EB2/B3
★	D13 – D22	S5566B
★	D199	1SS254

SWITCH

Mark	Symbol & Description	Part No.
★★	S1 Tact switch (TEST)	PSG-064

COILS AND FILTERS

Mark	Symbol & Description	Part No.
	L1 OSC coil	PTL-022
	VL1 VCO coil	PTL-031
	F1, F2 Low pass filter	PTF-009

CAPACITORS

Mark	Symbol & Description	Part No.
	C82	CCDCH220J50
	C29, C53, C71, C72	CCDCH330J50
	C83	CCDCH680J50
	C16, C47	CCDSL101J50
	C7, C46, C66, C67	CCDSL221J50
	C25, C26	CCDSL470J50
	C31	CCDSL560J50
	C21, C27	CCDSL820J50
	C52	CCDUJ221J50
	C50	CCDUJ331J50
	C48	CEANL010M50
	C44	CEANP010M50
	C49	CEANP220M16
	C57, C170	CEANP2R2M50
	C34	CEANP3R3M50
	C86	CEASR33M50
	C22	CEASR47M50
	C4, C88, C90, C99, C100 – C102, C105 – C108, C123, C124	CEAS100M50
	C97, C98	CEAS101M25
	C137, C138	CEAS101M50
	C133, C134	CEAS102M16
	C129, C130	CEAS102M25
	C144	CEASR10M50
	C3, C117, C118	CEAS220M50
	C135, C136	CEAS222M16
	C5, C6, C17, C19, C23, C36, C38, C63, C68, C70, C75, C76, C85, C87, C89, C92	CEAS 330M35
	C139	CEAS470M50
	C127, C128	CEAS471M25
	C9, C10	CKDYX104M25
	C11 – C13, C74, C95, C96, C111	CKDYF103Z50
	C116, C146	CKDYF473Z50
	C37, C81	CQMA102J50
	C55, C60	CQMA103K50
	C15, C39, C41, C56	CQMA104J50
	C45, C147, C148	CQMA222K50
	C30, C59	CQMA223J50
	C33	CQMA224K50
	C20	CQMA333J50
	C28	CQMA103J50
	C40	CQMA682J50
	C35, C43	CQMA683J50
	C58	CQMA822J50
	C114, C115	CQSA102J50
	C125, C126	CQSA221J50
	C121, C122	CQSF102J125

RESISTORS

NOTE: When ordering resistors, convert the resistance value into code form, and then rewrite the part no. as before.

Mark	Symbol & Description	Part No.
★	VR5 Semi-fixed (100kΩ)	VRTB6VS104
★	VR6 Semi-fixed (47kΩ)	VRTB6VS473
★	VR3, VR4, VR7 Semi-fixed (10kΩ)	VRTB6VS103
	R81, R82, R84, R85	RN1/6PQ□□□F
	R112	RA7S103J
	R113	RA8S103J
	R129, R143, R144, R147 – R150	RDR1/4PM□□□J
	R8, R9, R43, R44	RD1/2PM□□□J
	Other resistors	RD1/6PM□□□J

OTHERS

Mark	Symbol & Description	Part No.
	JA1 Pin jack (AUDIO OUT)	PKB-016
★	X2 Ceramic resonator	KBR-4.0MS
★	X3 Ceramic resonator	KBR-800H
★	X4 Crystal resonator	PSS-009

● Function Board Assembly (XWX-241)

SEMICONDUCTORS

Mark	Symbol & Description	Part No.
★★	IC201	PD4063
★★	Q203, Q205	DTC124ES
★★	Q202	2SC1740S
★	D210	MTZ5.1B/C
★	D201 LED (RKS)	SLH-56VC3H
★	D203 LED (PLAY)	SLH-56MC3H
★	D202 LED (PAUSE)	SLH-56YC3H
★	D204 – D209	1SS254

SWITCHES

Mark	Symbol & Description	Part No.
★★	S201 – S224 Tact switch (OPERATION)	PSG-064

CAPACITORS

Mark	Symbol & Description	Part No.
	C201, C202	CKPUYB391K50
	C204	CEJA100M50
	C203	CEJA3R3M50
	C205	CKPUYF103Z25

RESISTORS

NOTE: When ordering resistors, convert the resistance value into code form, and then rewrite the part no. as before.

Mark	Symbol & Description	Part No.
	R207	RA4S103J
	R202	RD1/6PM124J (RD1/4PM124J)
	Other resistors	RD1/6PM□□□J

OTHERS

Mark	Symbol & Description	Part No.
★	V201 Fluorescent tube	PEL-053
★	X201 Ceramic resonator	RSS-034

Primary Board Assembly

SWITCH

Mark	Symbol & Description	Part No.
⚠ ★★	S401 Push switch (POWER)	PSA-009

CAPACITOR

Mark	Symbol & Description	Part No.
⚠	C401 (0.01μF)	RCG-009 (VCG-044)

Transformer Board Assembly

TRANSFORMER

Mark	Symbol & Description	Part No.
⚠ ★	Power transformer (AC120V)	PTT-263

CAPACITORS

Mark	Symbol & Description	Part No.
	C140 – C143	CKDYF103Z50

Headphone Board Assembly

SEMICONDUCTOR

Mark	Symbol & Description	Part No.
★★	IC301	M5218L

CAPACITORS

Mark	Symbol & Description	Part No.
	C301, C302	CEAS100M50
	C303	CKDYF103Z50

RESISTORS

NOTE: When ordering resistors, convert the resistance value into code form, and then rewrite the part no. as before.

Mark	Symbol & Description	Part No.
★	VR301 Variable resistor (20kΩ) (HEADPHONE LEVEL)	PCS-030
	Other resistor	RD1/6PM □□□ J

OTHERS

Mark	Symbol & Description	Part No.
	JA301 Jack (HEADPHONE)	PKN-004

Digital Filter Board Assembly

SEMICONDUCTORS

Mark	Symbol & Description	Part No.
★★	IC13	CX23034
★★	IC14	TC74HCU04P

CAPACITORS

Mark	Symbol & Description	Part No.
	C150	CCDCH330J50
	C78	CEAS330M35
	C94	CKDYB102K50

RESISTORS

NOTE: When ordering resistors, convert the resistance value into code form, and then rewrite the part no. as before.

Mark	Symbol & Description	Part No.
	All resistors	RD1/6PM□□□J

OTHERS

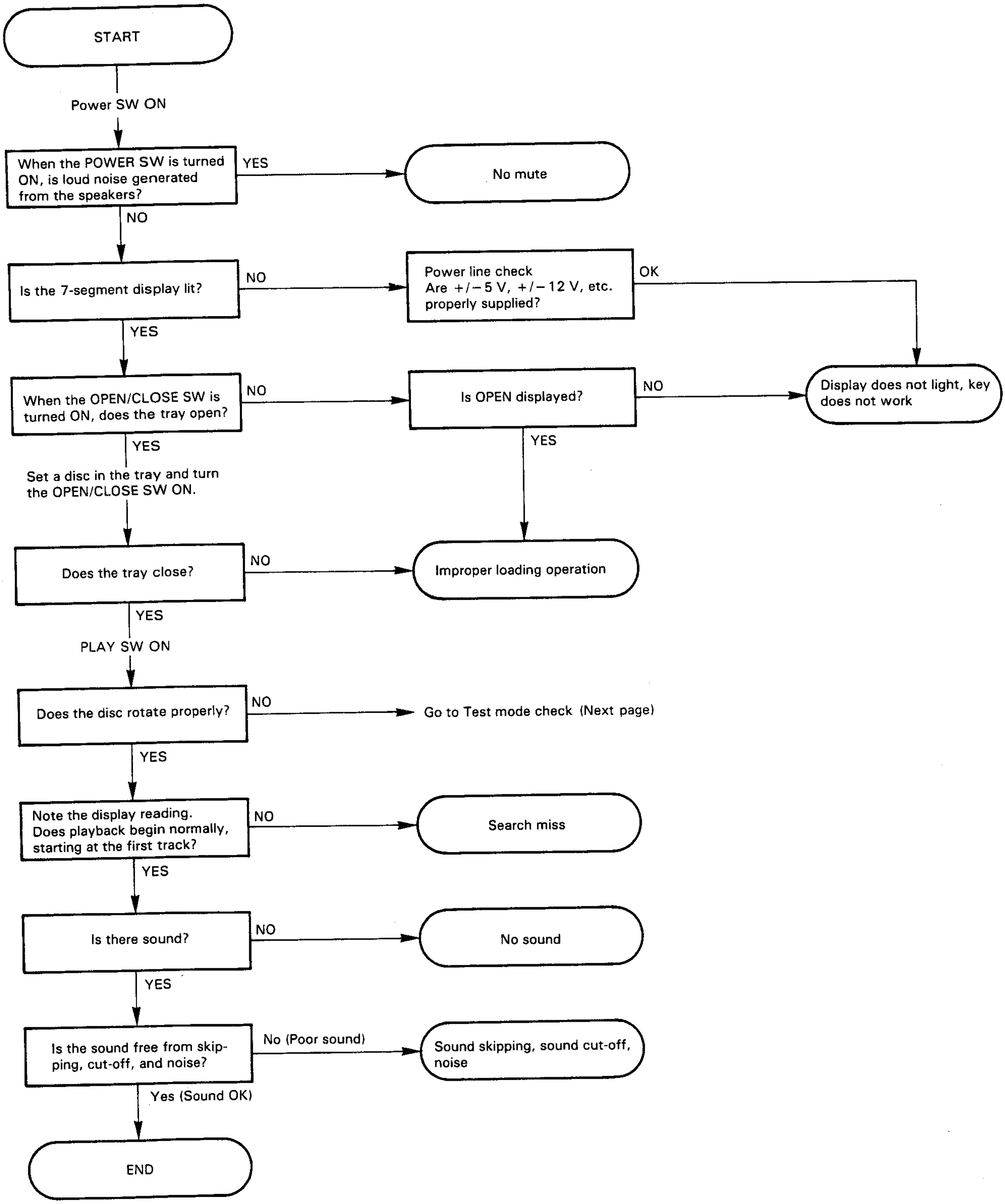
Mark	Symbol & Description	Part No.
	CN16 Connector socket (12P)	RKP-605

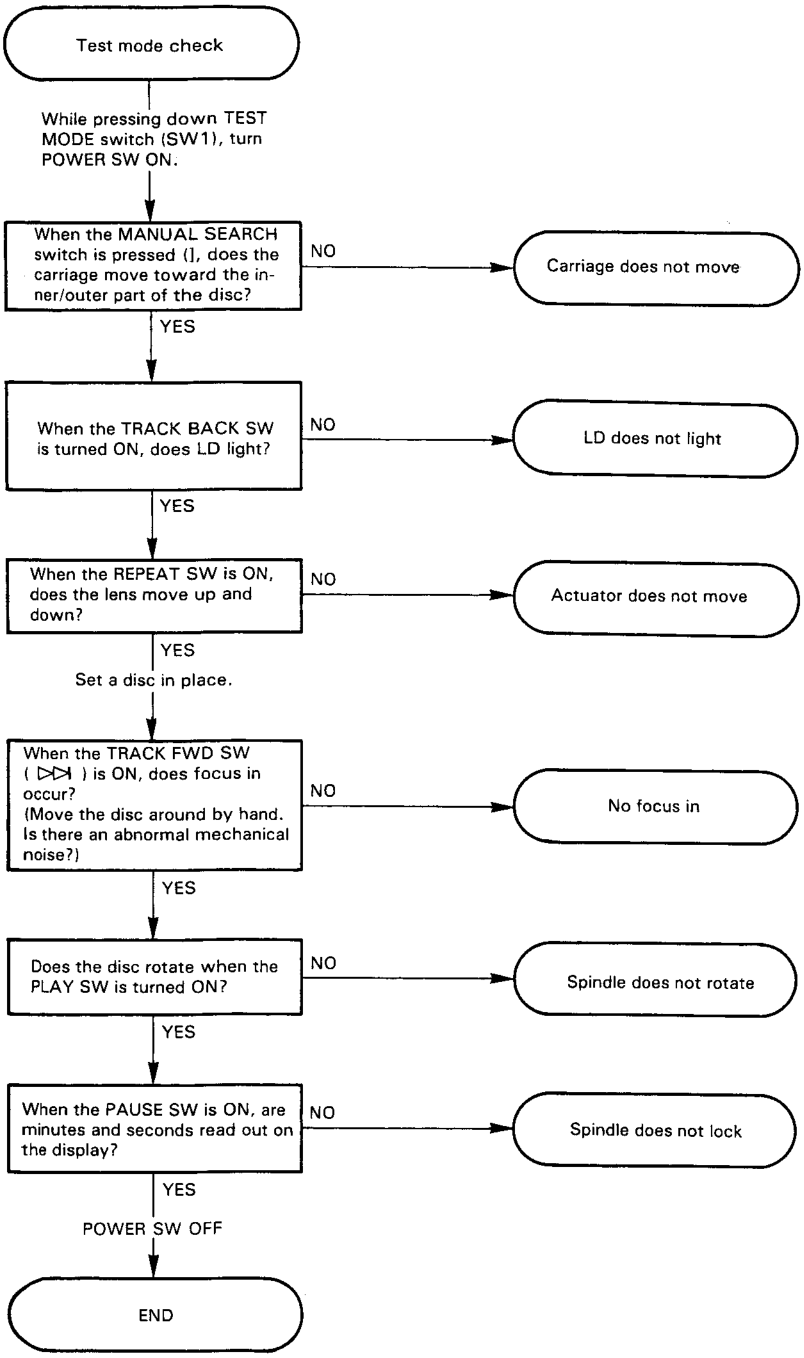
Subcode Board Assembly

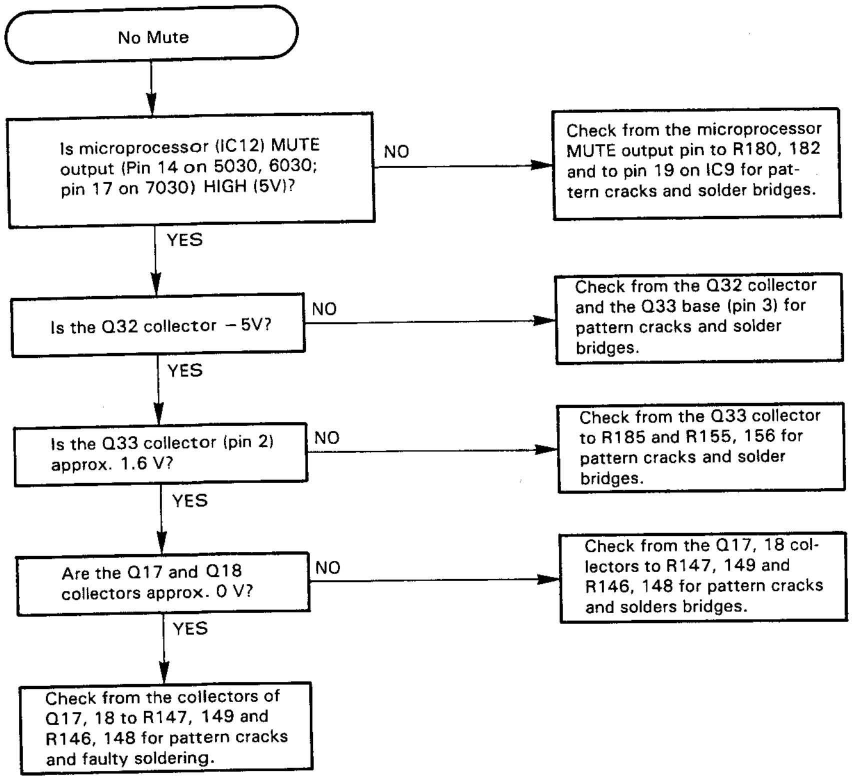
SOCKET

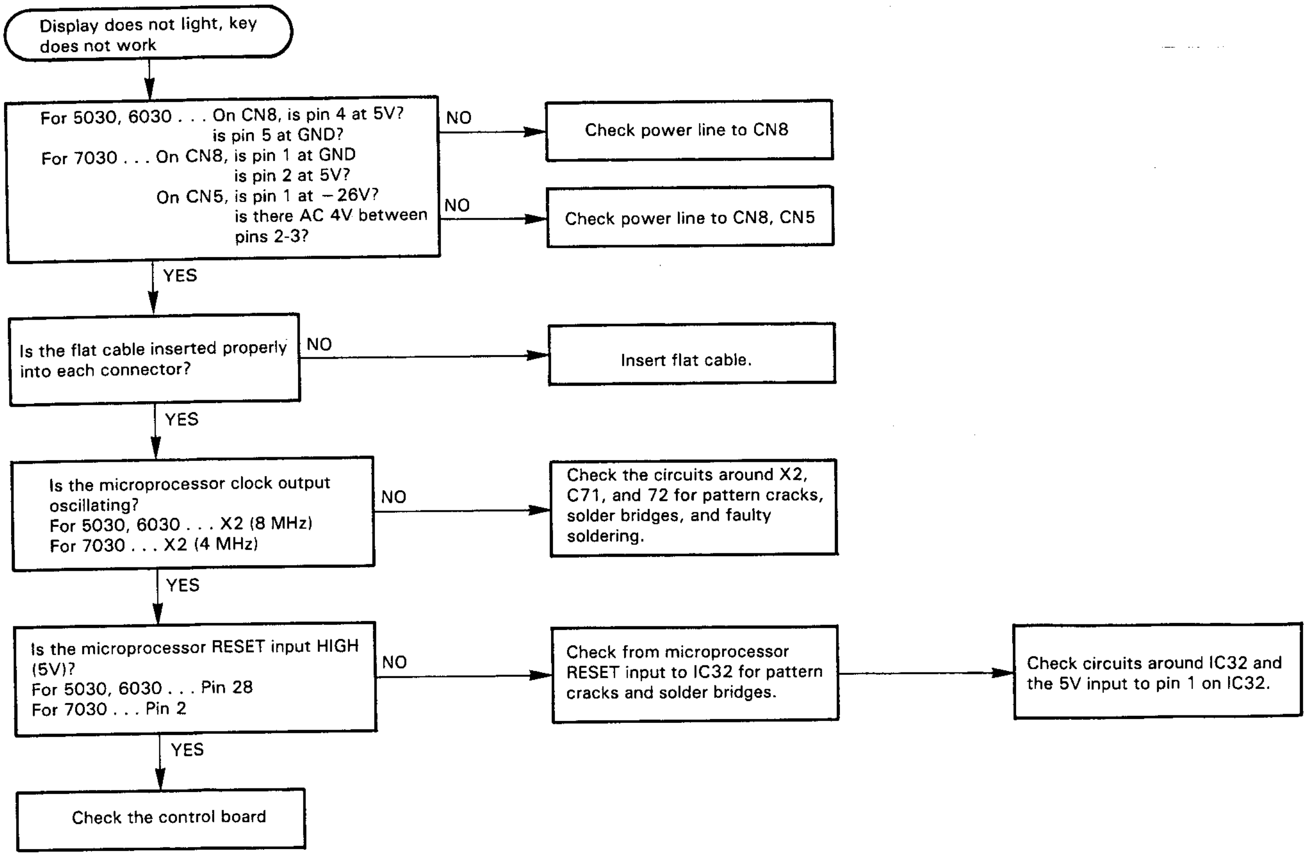
Mark	Symbol & Description	Part No.
	JA2 Socket 8P (SUBCODE)	PKP-038

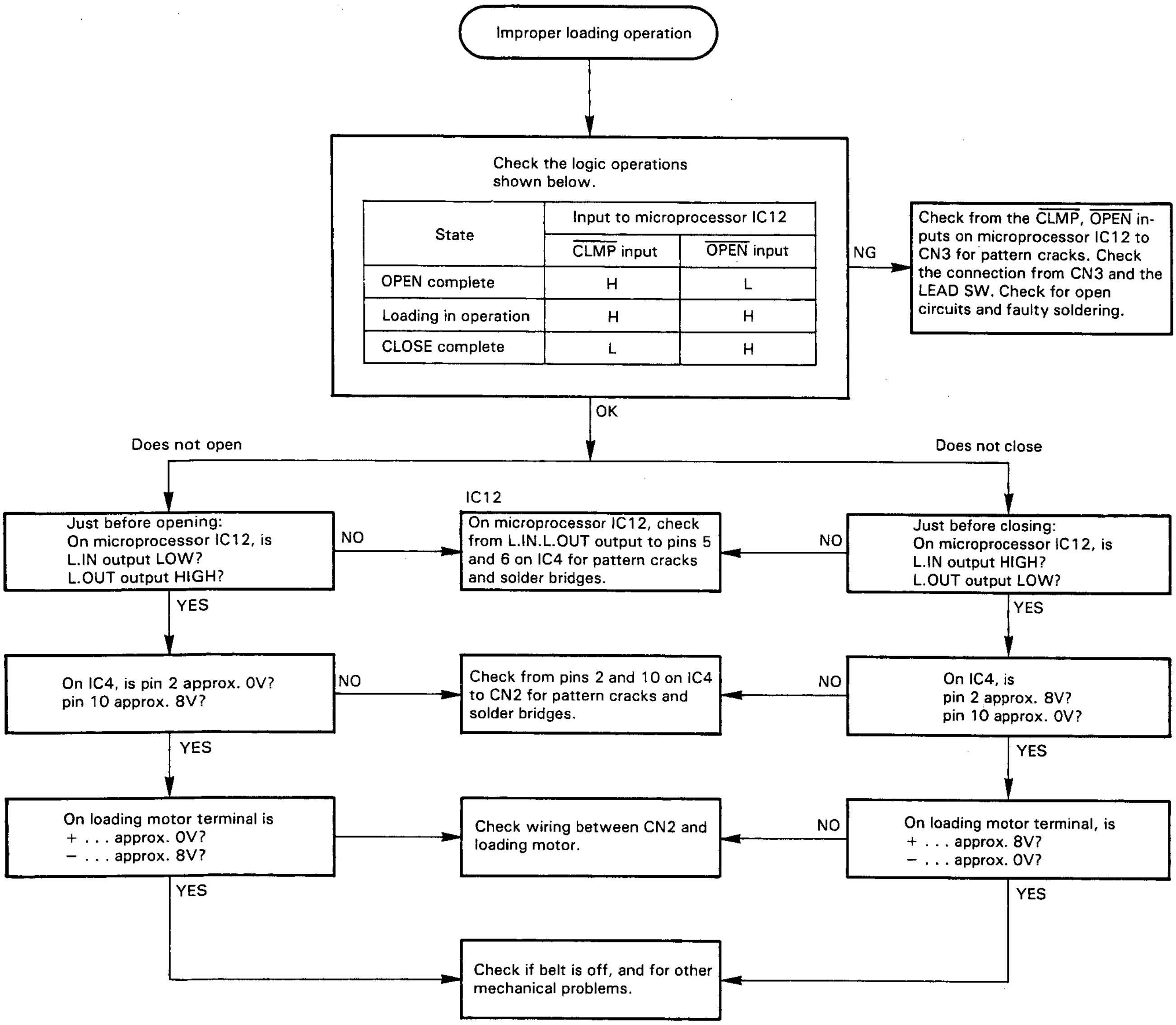
10. TROUBLESHOOTING


START
Power SW ON
When the POWER SW is turned ON, is loud noise generated from the speakers?
YES
No mute
NO
Is the 7-segment display lit?
NO
Power line check
Are +/−5 V, +/−12 V, etc. properly supplied?
OK
YES
When the OPEN/CLOSE SW is turned ON, does the tray open?
NO
Is OPEN displayed?
NO
Display does not light, key does not work
YES
YES
Set a disc in the tray and turn the OPEN/CLOSE SW ON.
Does the tray close?
NO
Improper loading operation
YES
PLAY SW ON
Does the disc rotate properly?
NO
Go to Test mode check (Next page)
YES
Note the display reading.
Does playback begin normally, starting at the first track?
NO
Search miss
YES
Is there sound?
NO
No sound
YES
Is the sound free from skipping, cut-off, and noise?
No (Poor sound)
Sound skipping, sound cut-off, noise
Yes (Sound OK)
END


Test mode check
While pressing down TEST MODE switch (SW1), turn POWER SW ON.
When the MANUAL SEARCH switch is pressed (], does the carriage move toward the inner/outer part of the disc?
NO
Carriage does not move
YES
When the TRACK BACK SW is turned ON, does LD light?
NO
LD does not light
YES
When the REPEAT SW is ON, does the lens move up and down?
NO
Actuator does not move
YES
Set a disc in place.
When the TRACK FWD SW (▷▷|) is ON, does focus in occur? (Move the disc around by hand. Is there an abnormal mechanical noise?)
NO
No focus in
YES
Does the disc rotate when the PLAY SW is turned ON?
NO
Spindle does not rotate
YES
When the PAUSE SW is ON, are minutes and seconds read out on the display?
NO
Spindle does not lock
YES
POWER SW OFF
END

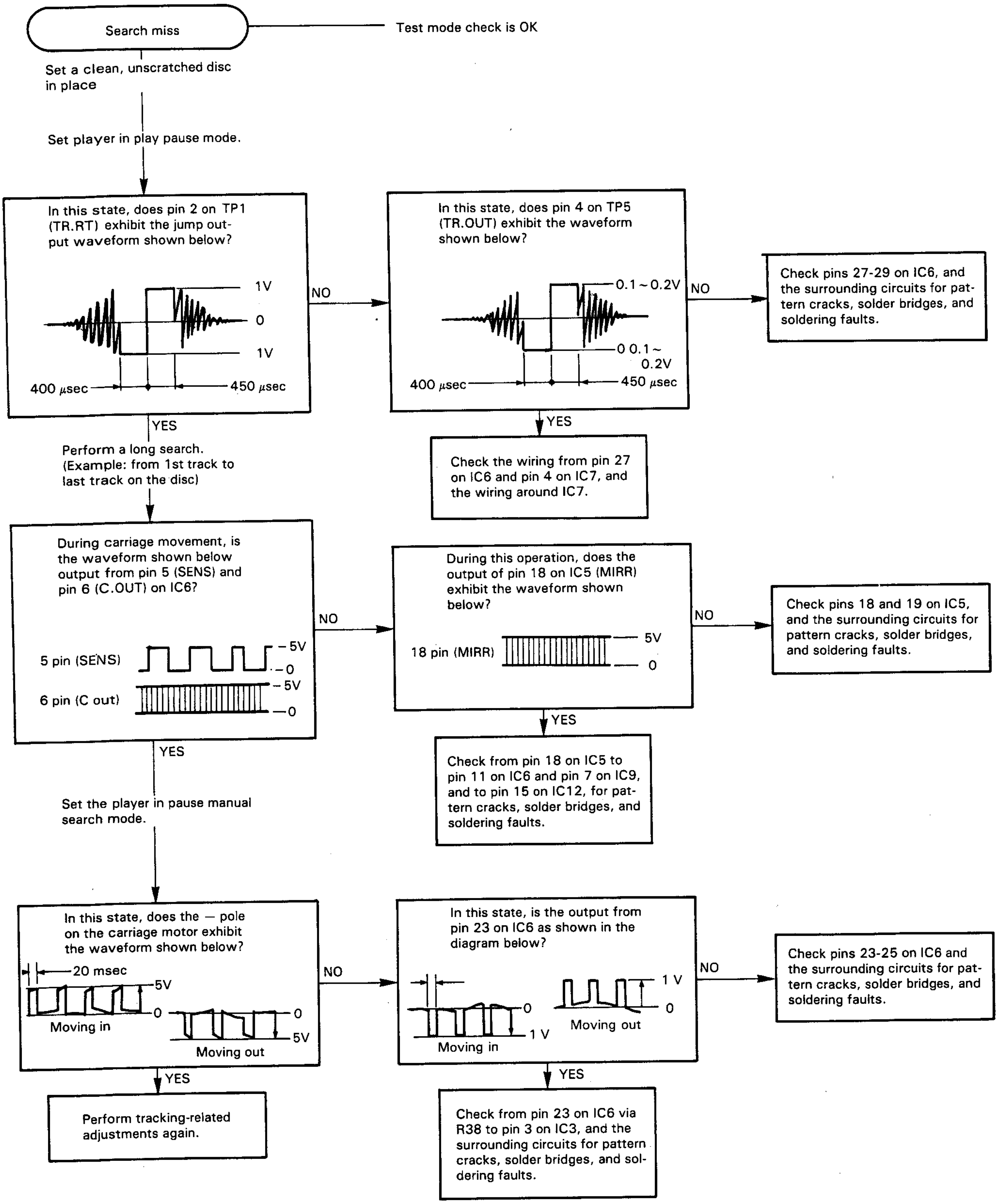

No Mute
Is microprocessor (IC12) MUTE output (Pin 14 on 5030, 6030; pin 17 on 7030) HIGH (5V)?
NO
Check from the microprocessor MUTE output pin to R180, 182 and to pin 19 on IC9 for pattern cracks and solder bridges.
YES
Is the Q32 collector −5V?
NO
Check from the Q32 collector and the Q33 base (pin 3) for pattern cracks and solder bridges.
YES
Is the Q33 collector (pin 2) approx. 1.6 V?
NO
Check from the Q33 collector to R185 and R155, 156 for pattern cracks and solder bridges.
YES
Are the Q17 and Q18 collectors approx. 0 V?
NO
Check from the Q17, 18 collectors to R147, 149 and R146, 148 for pattern cracks and solders bridges.
YES
Check from the collectors of Q17, 18 to R147, 149 and R146, 148 for pattern cracks and faulty soldering.


Display does not light, key does not work
For 5030, 6030 . . . On CN8, is pin 4 at 5V? is pin 5 at GND?
For 7030 . . . On CN8, is pin 1 at GND is pin 2 at 5V?
On CN5, is pin 1 at −26V? is there AC 4V between pins 2-3?
NO
Check power line to CN8
NO
Check power line to CN8, CN5
YES
Is the flat cable inserted properly into each connector?
NO
Insert flat cable.
YES
Is the microprocessor clock output oscillating?
For 5030, 6030 . . . X2 (8 MHz)
For 7030 . . . X2 (4 MHz)
NO
Check the circuits around X2, C71, and 72 for pattern cracks, solder bridges, and faulty soldering.
YES
Is the microprocessor RESET input HIGH (5V)?
For 5030, 6030 . . . Pin 28
For 7030 . . . Pin 2
NO
Check from microprocessor RESET input to IC32 for pattern cracks and solder bridges.
Check circuits around IC32 and the 5V input to pin 1 on IC32.
YES
Check the control board


Improper loading operation
Check the logic operations shown below.
NG
Check from the CLMP, OPEN inputs on microprocessor IC12 to CN3 for pattern cracks. Check the connection from CN3 and the LEAD SW. Check for open circuits and faulty soldering.
OK
Does not open
Does not close
Just before opening: On microprocessor IC12, is L.IN output LOW? L.OUT output HIGH?
NO
IC12
On microprocessor IC12, check from L.IN.L.OUT output to pins 5 and 6 on IC4 for pattern cracks and solder bridges.
NO
Just before closing: On microprocessor IC12, is L.IN output HIGH? L.OUT output LOW?
YES
On IC4, is pin 2 approx. 0V? pin 10 approx. 8V?
NO
Check from pins 2 and 10 on IC4 to CN2 for pattern cracks and solder bridges.
NO
On IC4, is pin 2 approx. 8V? pin 10 approx. 0V?
YES
YES
On loading motor terminal is + . . . approx. 0V? − . . . approx. 8V?
Check wiring between CN2 and loading motor.
NO
On loading motor terminal, is + . . . approx. 8V? − . . . approx. 0V?
YES
YES
Check if belt is off, and for other mechanical problems.

State	Input to microprocessor IC12	
	$\overline{\text{CLMP}}$ input	$\overline{\text{OPEN}}$ input
OPEN complete	H	L
Loading in operation	H	H
CLOSE complete	L	H

Mode	IC4		CN2	
	5 pin	6 pin	1 pin	2 pin
CLOSE complete	H	H	0V	0V
During CLOSE	H	L	8V	0V
During OPEN	L	H	0V	8V
OPEN complete	L	L	0V	0V



Search miss

Test mode check is OK

Set a clean, unscratched disc in place

Set player in play pause mode.

In this state, does pin 2 on TP1 (TR.RT) exhibit the jump output waveform shown below?

1V
0
1V
400 μsec
450 μsec
NO

In this state, does pin 4 on TP5 (TR.OUT) exhibit the waveform shown below?

0.1 ~ 0.2V
0 0.1 ~ 0.2V
400 μsec
450 μsec
NO

Check pins 27-29 on IC6, and the surrounding circuits for pattern cracks, solder bridges, and soldering faults.

YES

Check the wiring from pin 27 on IC6 and pin 4 on IC7, and the wiring around IC7.

Perform a long search. (Example: from 1st track to last track on the disc)

During carriage movement, is the waveform shown below output from pin 5 (SENS) and pin 6 (C.OUT) on IC6?

5 pin (SENS)
5V
0
6 pin (C out)
5V
0
NO

During this operation, does the output of pin 18 on IC5 (MIRR) exhibit the waveform shown below?

18 pin (MIRR)
5V
0
NO

Check pins 18 and 19 on IC5, and the surrounding circuits for pattern cracks, solder bridges, and soldering faults.

Check from pin 18 on IC5 to pin 11 on IC6 and pin 7 on IC9, and to pin 15 on IC12, for pattern cracks, solder bridges, and soldering faults.

Set the player in pause manual search mode.

In this state, does the − pole on the carriage motor exhibit the waveform shown below?

20 msec
5V
0
Moving in
0
5V
Moving out
NO

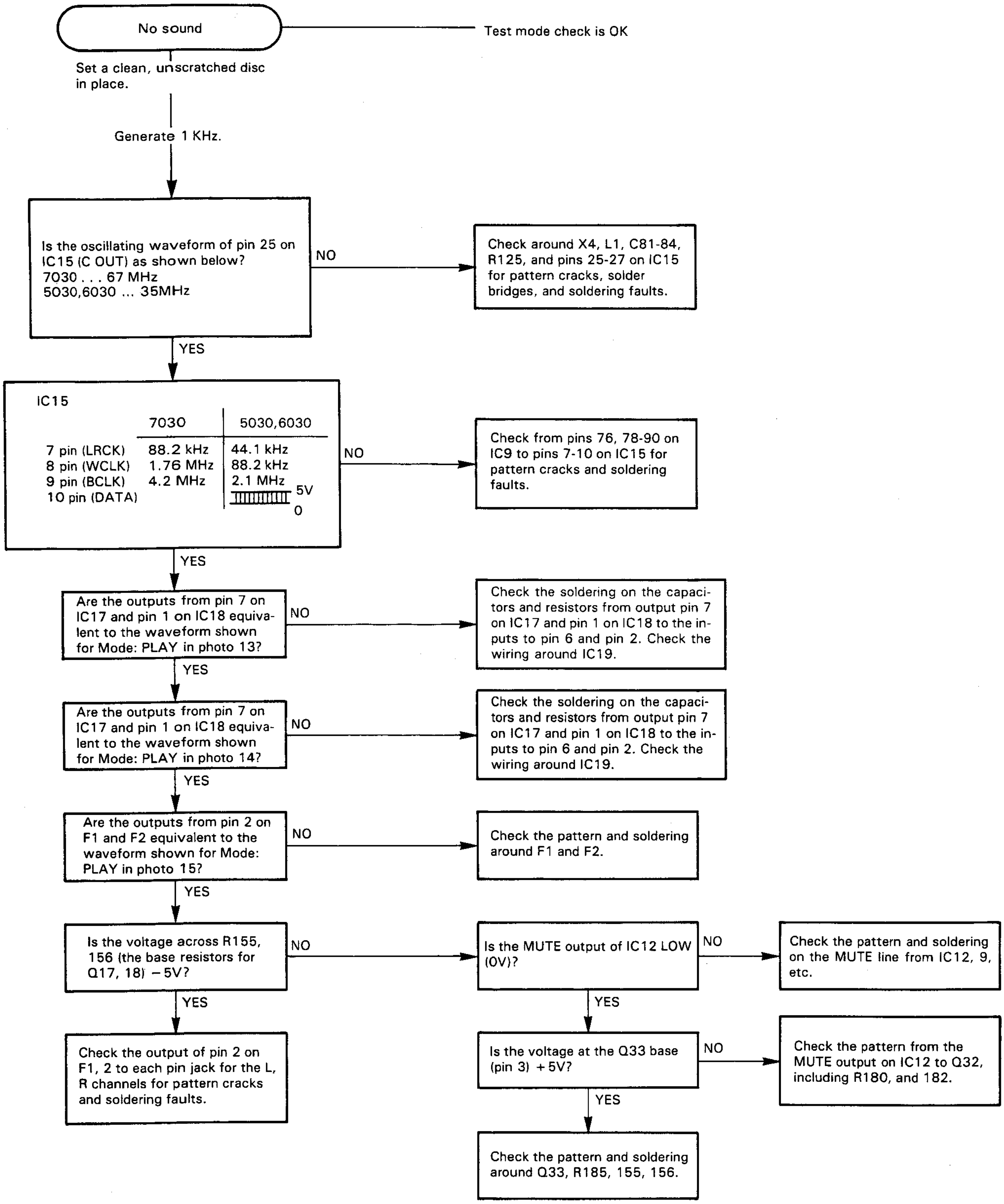
In this state, is the output from pin 23 on IC6 as shown in the diagram below?

0
1 V
Moving in
1 V
0
Moving out
NO

Check pins 23-25 on IC6 and the surrounding circuits for pattern cracks, solder bridges, and soldering faults.

Perform tracking-related adjustments again.

Check from pin 23 on IC6 via R38 to pin 3 on IC3, and the surrounding circuits for pattern cracks, solder bridges, and soldering faults.



No sound

Test mode check is OK

Set a clean, unscratched disc in place.

Generate 1 KHz.

Is the oscillating waveform of pin 25 on IC15 (C OUT) as shown below?
7030 . . . 67 MHz
5030,6030 ... 35MHz

NO

Check around X4, L1, C81-84, R125, and pins 25-27 on IC15 for pattern cracks, solder bridges, and soldering faults.

YES

IC15

	7030	5030,6030
7 pin (LRCK)	88.2 kHz	44.1 kHz
8 pin (WCLK)	1.76 MHz	88.2 kHz
9 pin (BCLK)	4.2 MHz	2.1 MHz
10 pin (DATA)		

NO

Check from pins 76, 78-90 on IC9 to pins 7-10 on IC15 for pattern cracks and soldering faults.

YES

Are the outputs from pin 7 on IC17 and pin 1 on IC18 equivalent to the waveform shown for Mode: PLAY in photo 13?

NO

Check the soldering on the capacitors and resistors from output pin 7 on IC17 and pin 1 on IC18 to the inputs to pin 6 and pin 2. Check the wiring around IC19.

YES

Are the outputs from pin 7 on IC17 and pin 1 on IC18 equivalent to the waveform shown for Mode: PLAY in photo 14?

NO

Check the soldering on the capacitors and resistors from output pin 7 on IC17 and pin 1 on IC18 to the inputs to pin 6 and pin 2. Check the wiring around IC19.

YES

Are the outputs from pin 2 on F1 and F2 equivalent to the waveform shown for Mode: PLAY in photo 15?

NO

Check the pattern and soldering around F1 and F2.

YES

Is the voltage across R155, 156 (the base resistors for Q17, 18) −5V?

YES

Check the output of pin 2 on F1, 2 to each pin jack for the L, R channels for pattern cracks and soldering faults.

NO

Is the MUTE output of IC12 LOW (0V)?

NO

Check the pattern and soldering on the MUTE line from IC12, 9, etc.

YES

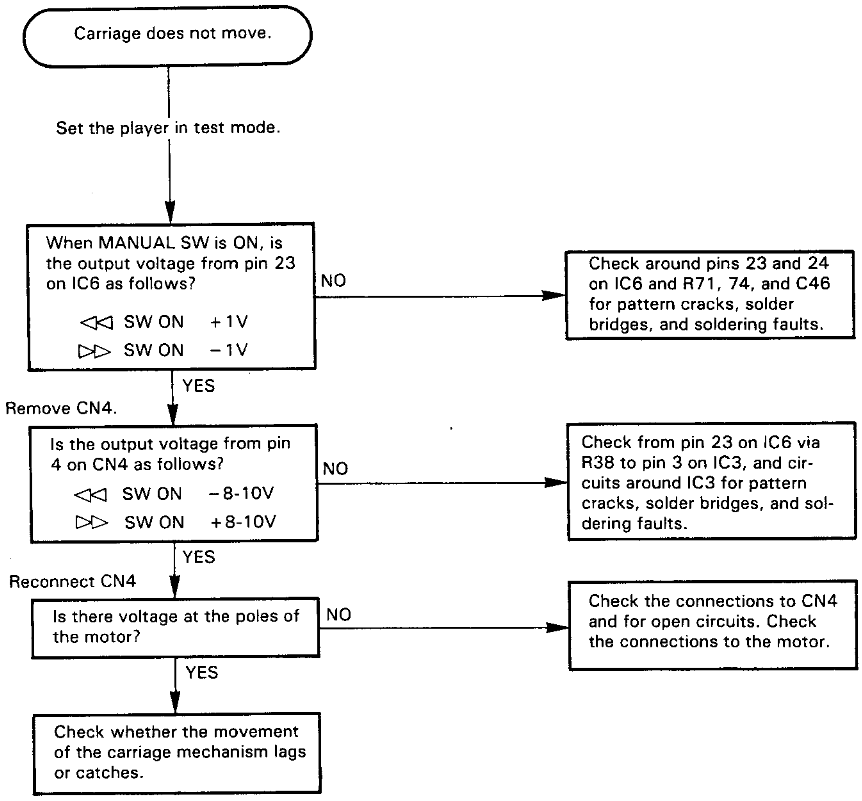
Is the voltage at the Q33 base (pin 3) +5V?

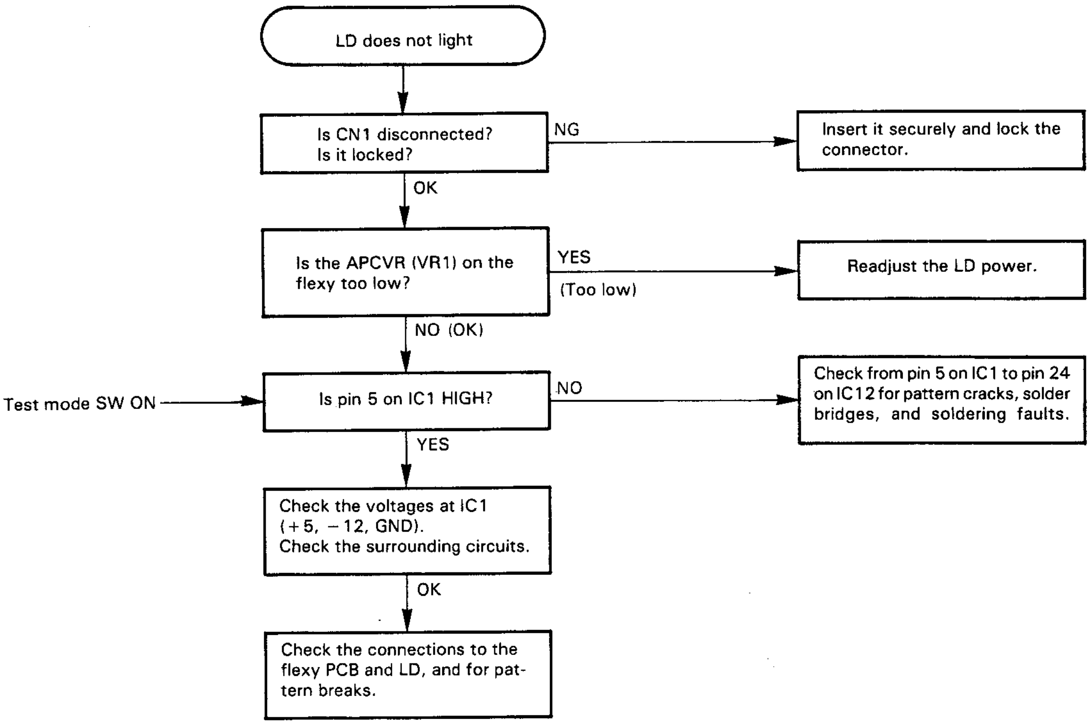
NO

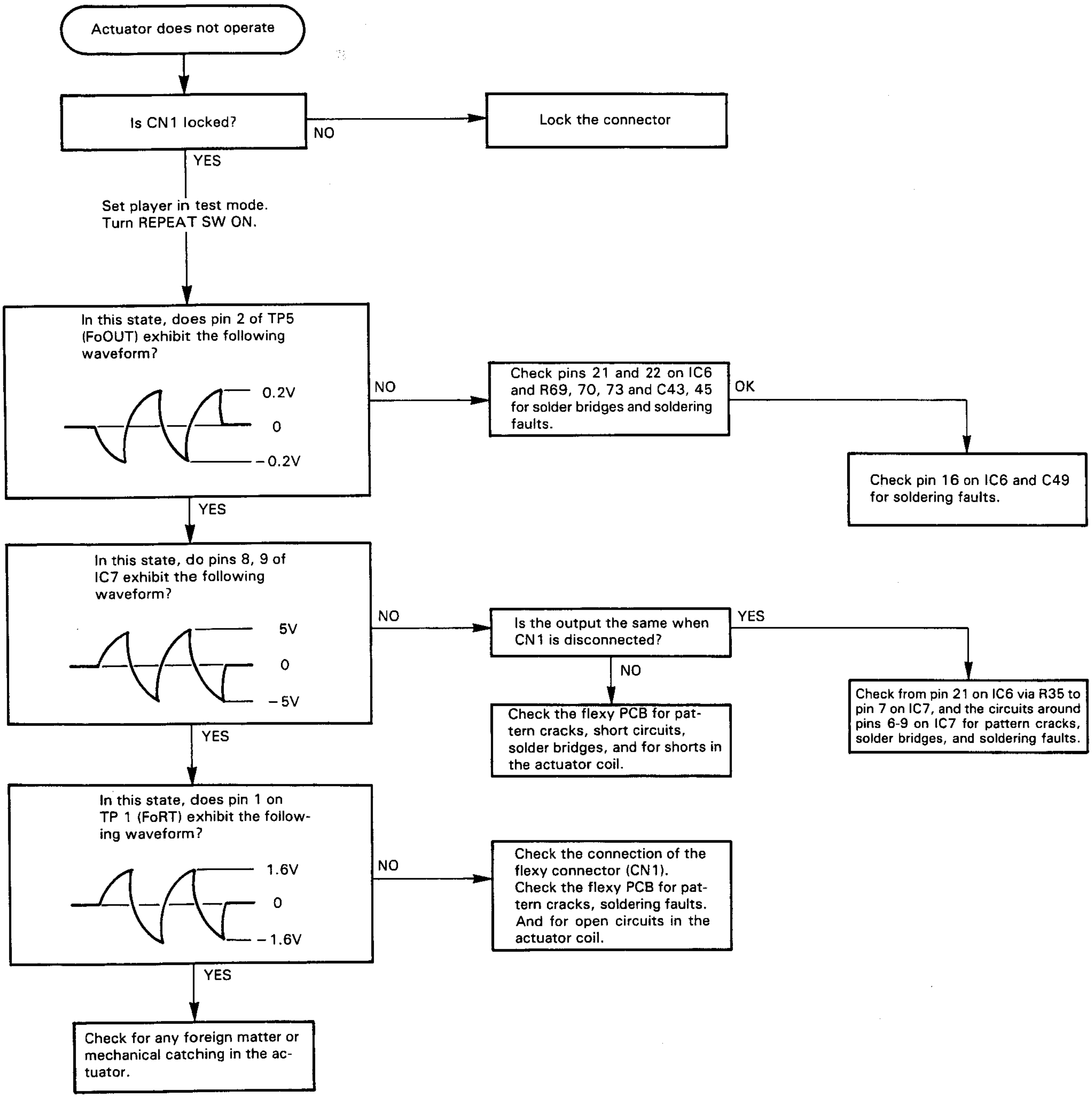
Check the pattern from the MUTE output on IC12 to Q32, including R180, and 182.

YES

Check the pattern and soldering around Q33, R185, 155, 156.


Carriage does not move.
Set the player in test mode.
When MANUAL SW is ON, is the output voltage from pin 23 on IC6 as follows?
◁◁ SW ON +1V
▷▷ SW ON −1V
NO
Check around pins 23 and 24 on IC6 and R71, 74, and C46 for pattern cracks, solder bridges, and soldering faults.
YES
Remove CN4.
Is the output voltage from pin 4 on CN4 as follows?
◁◁ SW ON −8-10V
▷▷ SW ON +8-10V
NO
Check from pin 23 on IC6 via R38 to pin 3 on IC3, and circuits around IC3 for pattern cracks, solder bridges, and soldering faults.
YES
Reconnect CN4
Is there voltage at the poles of the motor?
NO
Check the connections to CN4 and for open circuits. Check the connections to the motor.
YES
Check whether the movement of the carriage mechanism lags or catches.


LD does not light
Is CN1 disconnected?
Is it locked?
NG
Insert it securely and lock the connector.
OK
Is the APCVR (VR1) on the flexy too low?
YES
(Too low)
Readjust the LD power.
NO (OK)
Test mode SW ON
Is pin 5 on IC1 HIGH?
NO
Check from pin 5 on IC1 to pin 24 on IC12 for pattern cracks, solder bridges, and soldering faults.
YES
Check the voltages at IC1 (+5, −12, GND).
Check the surrounding circuits.
OK
Check the connections to the flexy PCB and LD, and for pattern breaks.


Actuator does not operate
Is CN1 locked?
NO
Lock the connector
YES
Set player in test mode.
Turn REPEAT SW ON.
In this state, does pin 2 of TP5 (FoOUT) exhibit the following waveform?
0.2V
0
−0.2V
NO
Check pins 21 and 22 on IC6 and R69, 70, 73 and C43, 45 for solder bridges and soldering faults.
OK
Check pin 16 on IC6 and C49 for soldering faults.
YES
In this state, do pins 8, 9 of IC7 exhibit the following waveform?
5V
0
−5V
NO
Is the output the same when CN1 is disconnected?
YES
Check from pin 21 on IC6 via R35 to pin 7 on IC7, and the circuits around pins 6-9 on IC7 for pattern cracks, solder bridges, and soldering faults.
NO
Check the flexy PCB for pattern cracks, short circuits, solder bridges, and for shorts in the actuator coil.
YES
In this state, does pin 1 on TP 1 (FoRT) exhibit the following waveform?
1.6V
0
−1.6V
NO
Check the connection of the flexy connector (CN1). Check the flexy PCB for pattern cracks, soldering faults. And for open circuits in the actuator coil.
YES
Check for any foreign matter or mechanical catching in the actuator.

11. ADJUSTMENTS

The Compact Disc Player adjustment are to be executed in the following order.

• Adjustment Items

1. Tracking offset and focus offset adjustments
2. LD (laser diode) power check
3. Focus lock and spindle lock checks
4. Grating adjustment
5. Tracking balance adjustment
6. Tangential adjustment
7. Focus gain adjustment
8. Tracking gain adjustment
9. VCO free-run frequency adjustment

• Measuring Equipment

1. Dual trace oscilloscope
2. Optical power meter
3. Test disc (YEDS7)
4. Focus and tracking adjustment filters
5. Loop gain adjustment bandpass filter
6. Signal generator
7. Grating driver
8. Other regular measuring equipment

• Test Mode

Disc player adjustments are executed in test mode.

Test mode setting and cancellation procedures

(1) Switch POWER (S401) on while depressing the TEST MODE switch (S1).
(2) Then switch the MANUAL SEARCH FWD (▷▷) or REV (◁◁) switch on to activate test mode.
(3) Test mode is cancelled by switching POWER off.

The various key functions during test mode are listed in Table 11-1.

• Adjustment Controls

VR7:	Tracking offset (TR.OF)
VR3:	Focus gain (FO.GA)
VR4:	Tracking gain (TR.GA)
VR5:	Tracking balance (TR.BL)
VR6:	Focus offset (FO.OF)
VL1:	VCO free run (VCO coil)

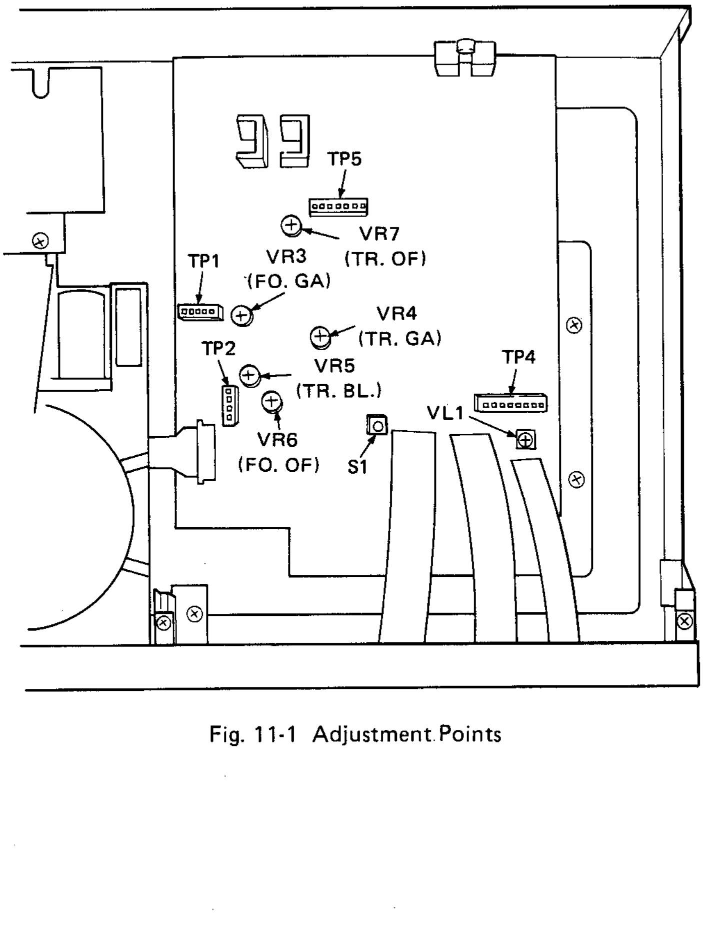
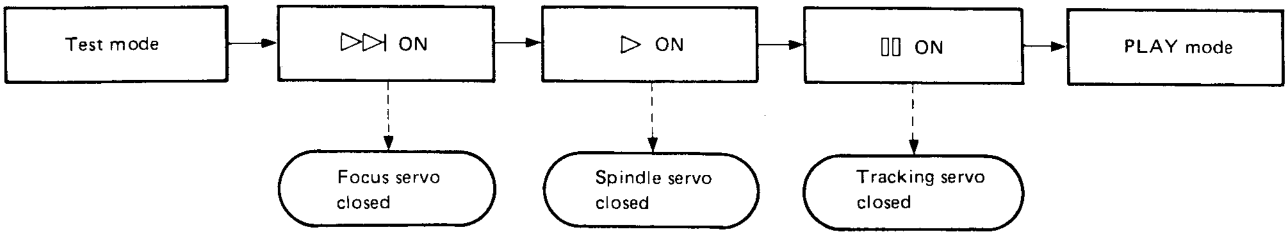


Fig. 11-1 Adjustment Points

During test mode, each servo mechanism can be closed and opened by separate operations. Consequently, each servo must be closed one at a time (in serial sequence) to set play mode. Note that play mode is not activated by simply pressing the PAUSE key (▯▯) during test mode.

Example: Switch from stop to play mode.



- The servo mechanisms comply with a serial sequence during test mode.

● Key Function in Test Mode

Symbol	Key	Function during test mode	Description
▷▷|	TRACK FWD	Focus servo closed	Laser diode lights up, focus actuator is moved up/down, and focus servo is closed.
▷	PLAY	Spindle servo closed	Spindle servo closed in CLV-A mode after spindle motor is kicked.
▯▯	PAUSE	Tracking servo closed/opened	Tracking servo closed by pressing in a toggle action, and player is switched to play mode (with the focus and spindle servos closed). PAUSE indicator lights up, and tracking servo is opened when pressed a second time.
◁◁	MANUAL SEARCH REV	Carriage reverse (towards disc center)	Carriage is moved towards disc center at the fast speed of about 1cm/sec. Since there is no safety mechanism to stop the carriage, do not move it too far.
▷▷	MANUAL SEARCH FWD	Carriage forward (towards disc edge)	Carriage is moved towards disc edge at the fast speed of about 1cm/sec. Since there is no safety mechanism to stop the carriage, do not move it too far.
▭	REPEAT	Lens moved up/down	The laser diode lights up, and the focus actuator is moved up/down. The focus servo is not closed.
□	STOP	Stop	All servos are stopped and reset to the initial status.
⏏	OPEN/CLOSE	(Disc tray) opened/closed	Disc tray is opened/closed. Note pickup does not return to arm rest when tray is opened, and remains in the same position when tray is closed.

Table 11-1

Step No.	Oscilloscope position		Test points	Adjustment positions	Check items/ Adjustment specifications	Adjustment procedure
	V	H				
1	**TRACKING OFFSET AND FOCUS OFFSET ADJUSTMENT**					
						• Set the player to test mode (see page 51).
			TP 1 Pin 2 (TR. RT)	VR 7 (TR. OF)	0V ± 10mV	• Adjust the voltage at TP1 pin 2 TR.RT (tracking return) to 0V ±10mV by turning the VR 7 TR.OF (tracking offset) control.
			TP 1 Pin 5 (FO. ER)	VR 6 (FO.OF)	0V ± 10mV	• Adjust the voltage at TP1 pin 5 FO.ER (focus error) to 0V ±10mV by turning the VR6 FO.OF (focus offset) control.
						Note: When adjusting VR7, be careful not to short VR7 and the IC7 heat sink (wrap insulating material around the screw driver as a precaution).
2	**LD (LASER DIODE) POWER CHECK**					
						• Set to normal mode. (Normal mode can be set by switching the power off and on again.)
						• Position the optical power meter sensor immediately above the object lens.
					Specified rating (0.21mW ± 0.02mW)	• Press the PLAY key without a disc loaded, and check that the LD (laser diode) power reading in the optical power meter is within the specified rating range (0.21mW ±0.02 mW).
						• After adjusting the LD POWER, play the YEDS7 TEST DISC and measure the RF waveform P-P voltage.
						• If the RF waveform P-P voltage exceeds 1.5V, readjust the LD POWER to bring it to 1.5V.
3	**FOCUS LOCK AND SPINDLE LOCK ADJUSTMENT**					
						• Load the test disc.
						• Set the player to test mode (see page 51).
						• Press the MANUAL SEARCH FWD key (▷▷) to move the pick-up to about the center of the disc. Note that step must be executed.
	V 0.5V/div	H 100msec /div	TP2 Pin 1 (RF output)		RF output generated	• Observe TP2 pin 1 RF (RF output) by oscilloscope to check that an RF output signal is generated when the TRACK FWD key (▷▷I) is pressed.
					Normal rotation	• Press the PLAY key (▷) and check that the disc rotates at normal speed (about 300rpm near the center of the disc) in the correct direction (clockwise).

Step No.	Oscilloscope position		Test points	Adjustment positions	Check items/ Adjustment specifications	Adjustment procedure
	V	H				
4	GRATING ADJUSTMENT					
						• Remove the tray by removing the two screws. • Open the clamper and place a disc. • Set the player to test mode (see page 51). • Press the TRACK FWD (▷▷|) and PLAY (▷) keys in that order to close the focus and spindle servos (leaving the tracking servo open). • Using the MANUAL SEARCH FWD key (▷▷), move the pick-up to a position near the outside of the disc, and ensure that the ⊖ driver can enter the pick-up grating adjustment hole from the top of the set by the pick-up movement. (See Figure 11-3).
			TP 1 Pin 4 (TR. ER)	Grating	NULL point	• Observe the TP1 pin 4 TR.ER (tracking error) waveform by oscilloscope. Insert a 4kHz cut-off low pass filter at this stage. (See Figure 11-2)

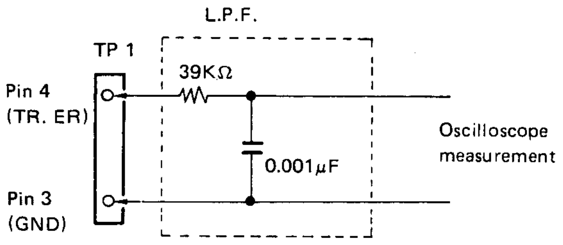


Fig. 11-2

Step No.	Oscilloscope position V	Oscilloscope position H	Test points	Adjustment positions	Check items/ Adjustment specifications	Adjustment procedure
						• Inser the tracking driver into the adjustment hole and turn the driver to find the NULL point (see Photograph 11-1).
				Grating	Maximum amplitude	• Next turn the grating driver slowly clockwise from the NULL point and adjust to the positon where the waveform (tracking error signal) first reaches maximum amplitude (see Figure 11-3).
			X axis TP2 pin 3 (BKTE) Y axis TP2 pin 2 (FWTE)	Grating	Lissajous 45°	• Connect TP2 pin 3 (BKTE) to the X axis of the oscilloscope, and pin 2 (FWTE) to the Y axis by AC coupling, and observe the Lissajous pattern (see Photograph 11-4). • Fine adjust the grating driver to a position where the Lissajous pattern in practically as straight line (Lissajous 45°). (See Photograph 11-5)

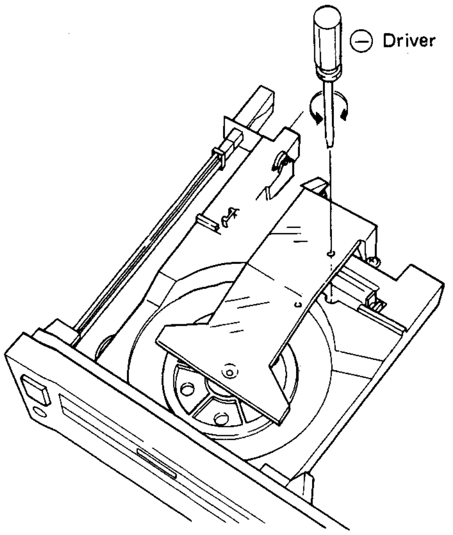
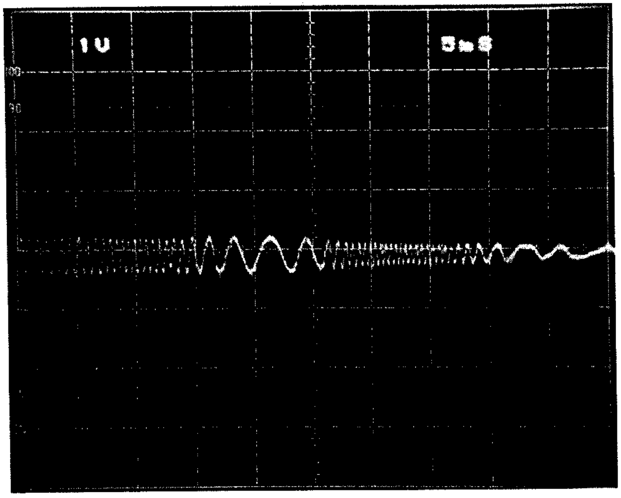
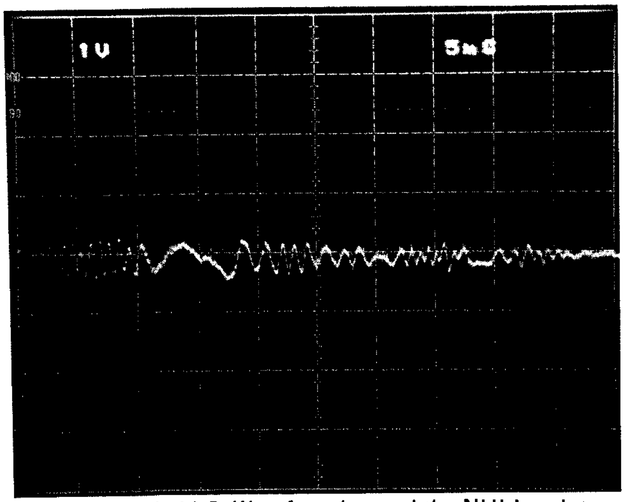


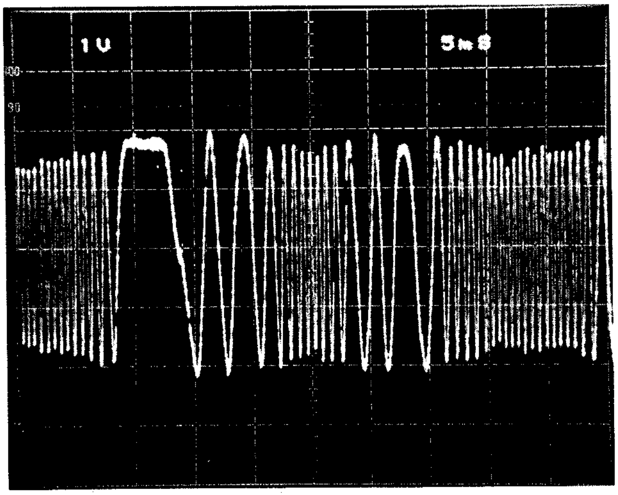
Fig. 11-3 Grating Adjustment



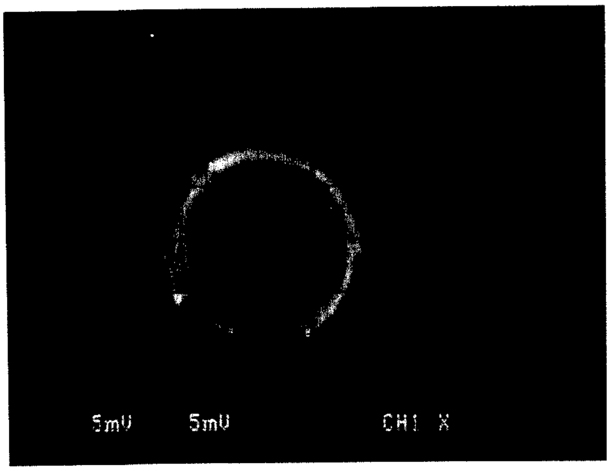
Photograph 11-1 NULL point



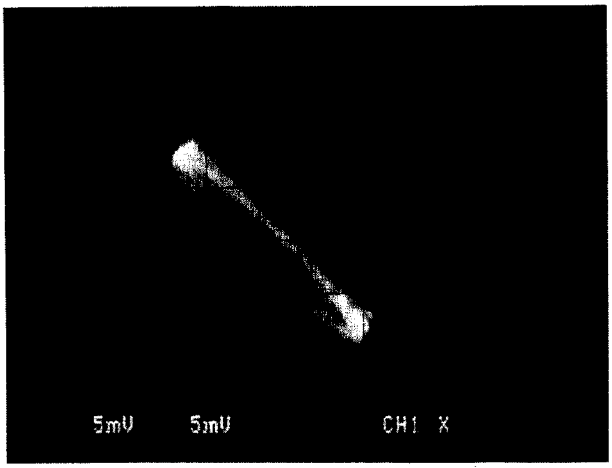
Photograph 11-2 Waveform beyond the NULL point



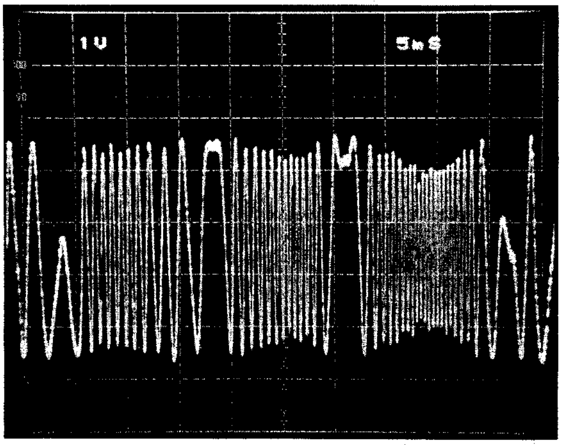
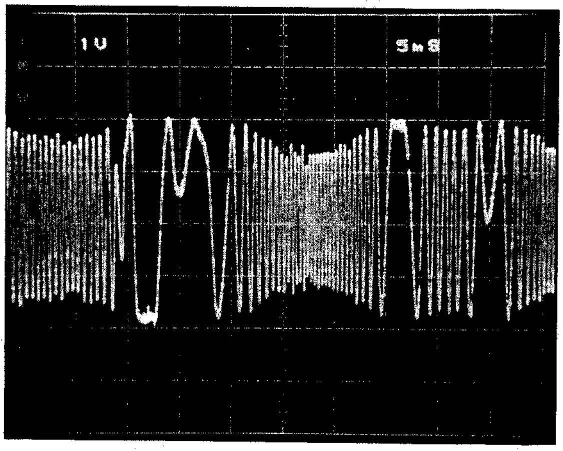
Photograph 11-3 Maximum amplitude



Photograph 11-4



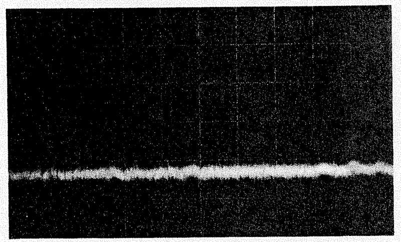
Photograph 11-5

Step No.	Oscilloscope position		Test points	Adjustment positions	Check items/ Adjustment specifications	Adjustment procedure
	V	H				
5	**TRACKING BALANCE ADJUSTMENT**					
	1V/div	5msec /div	TP 1 Pin 4 (TR. ER)	VR 5 (TR. BL)		• Load the test disc. • Set the player to test mode (see page 51). • Move the carriage to a position near the center of the disc by using the MANUAL SEARCH FWD key (▷▷). • Press the TRACK FWD key (▷▷|) and then the PLAY key (▷) to start the disc turning. • Observe TP1 pin 4 TR.ER (tracking error) in the oscilloscope, and eliminate the DC component of the tracking error by adjustment the VR5 TR.BL (tracking balance) control.  Photograph 11-6 DC components included  Photograph 11-7 DC components excluded

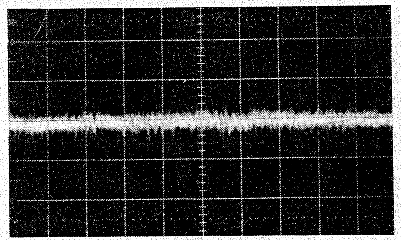
NOTE: The encircled numbers denote measuring points in the circuit and pattern diagrams.

- **Wave Form**

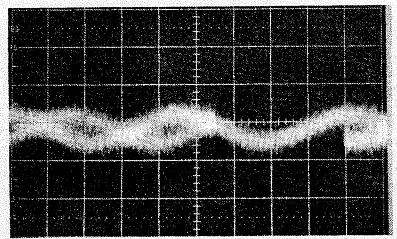
① TP2-2 MODE : PLAY
V: 200mV/div H: 2m sec/div



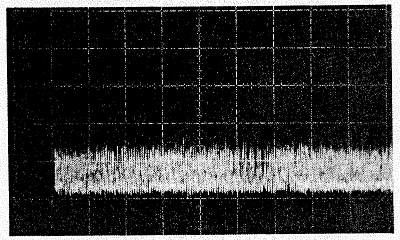
③ TP1-5 MODE : SEARCH
V: 500mV/div H: 5m sec/div



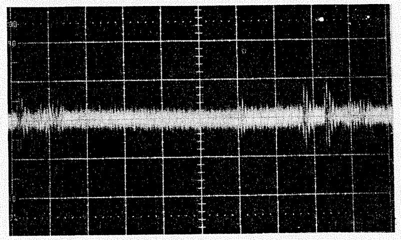
⑥ TP1-2 MODE : PLAY
V: 500mV/div H: 10m sec/div



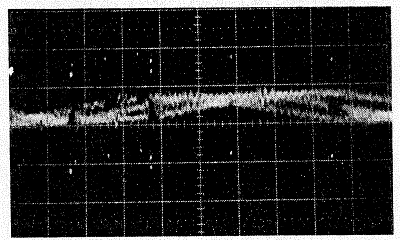
① TP2-2 MODE : SEARCH
V: 200mV/div H:2m sec/div



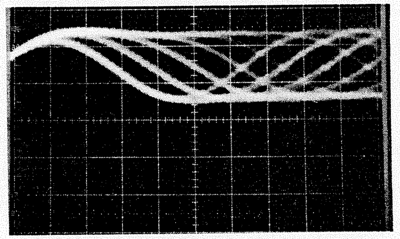
④ TP1-4 MODE : PLAY
V: 2V/div H: 20m sec/div



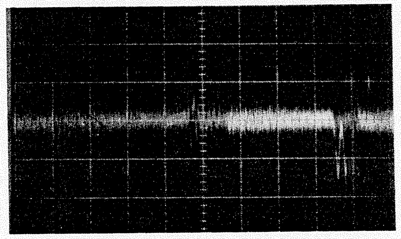
⑥ TP1-2 MODE : SEARCH
V: 500mV/div H: 10m sec/div



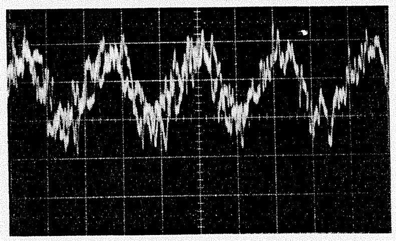
② TP2-1 MODE : PLAY
V: 1V/div H: 200n sec/div



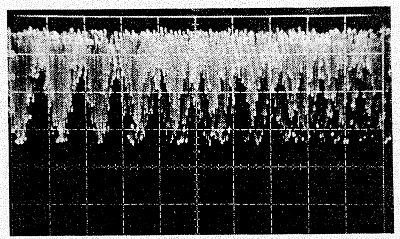
④ TP1-4 MODE : SEARCH
V: 2V/div H: 20m sec/div



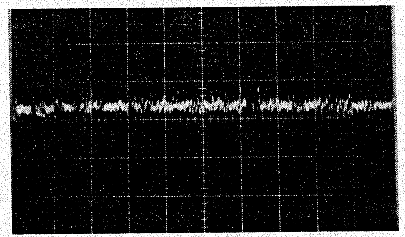
⑦ IC8-1 MODE : PLAY
V: 200mV/div H: 50m sec/div



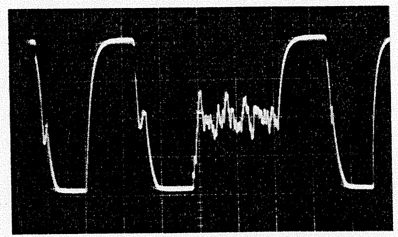
② TP2-1 MODE : SEARCH
V: 500mV/div H: 100µsec/div



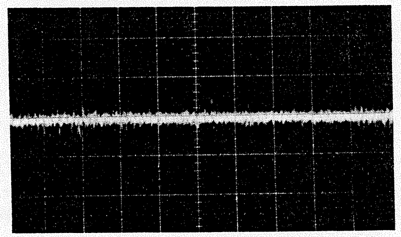
⑤ TP1-1 MODE : PLAY
V: 500mV/div H: 10m sec/div



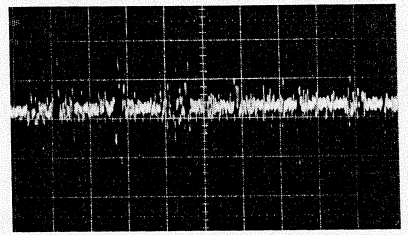
⑦ IC8-1 MODE : SEARCH
V: 2V/div H: 200m sec/div



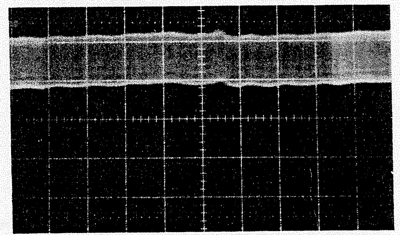
③ TP1-5 MODE : PLAY
V: 500mV/div H: 5m sec/div



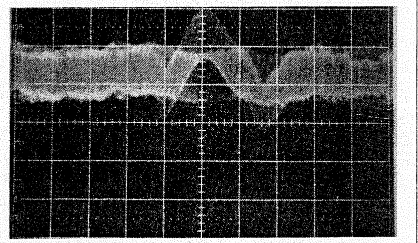
⑤ TP1-1 MODE : SEARCH
V: 500mV/div H: 10m sec/div



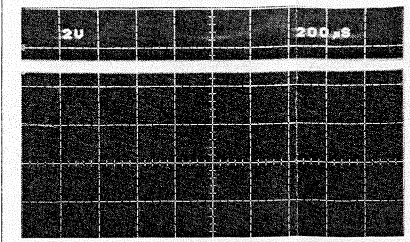
⑧ IC8-7 MODE : PLAY
V: 500mV/div H: 20m sec/div



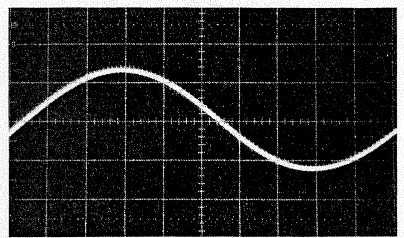
⑧ IC8-7 MODE : SEARCH
V: 500mV/div H: 20m sec/div



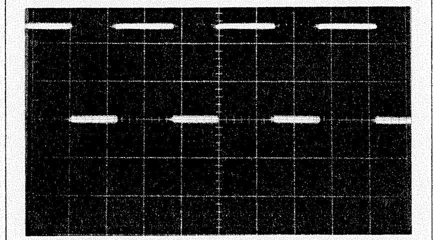
⑪ TP4-1 MODE : PLAY
V: 2V/div H: 20m sec/div



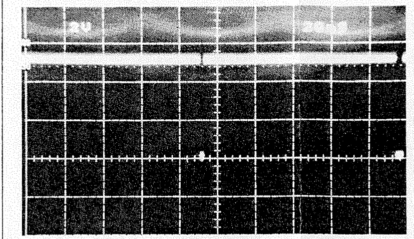
⑭ IC17-7 MODE : PLAY
V: 2V/div H: 100µsec/div



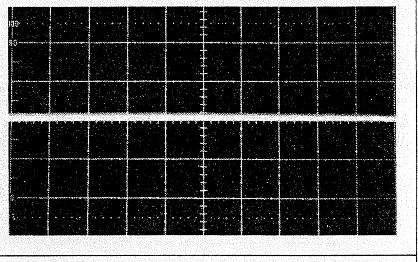
⑨ IC9-4 MODE : PLAY
V: 2V/div H: 50µsec/div



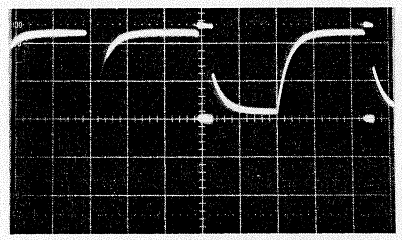
⑪ TP4-1 MODE : SEARCH
V: 2V/div H: 200µsec/div



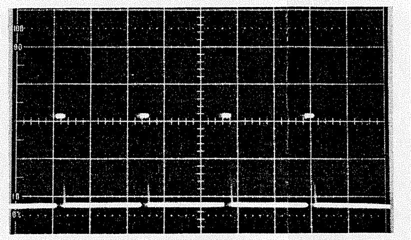
⑭ IC17-7 MODE : SEARCH
V: 2V/div H: 100µsec/div



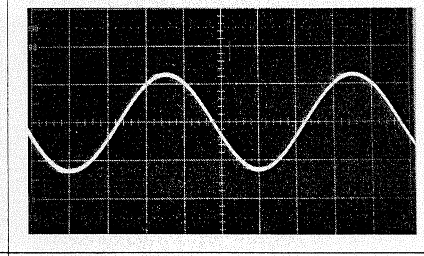
⑨ IC9-4 MODE : SEARCH
V: 2V/div H:100m sec/div



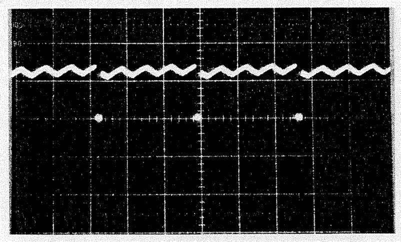
⑫ IC15-23 MODE : PLAY or SEARCH
V: 2V/div H: 5µsec/div



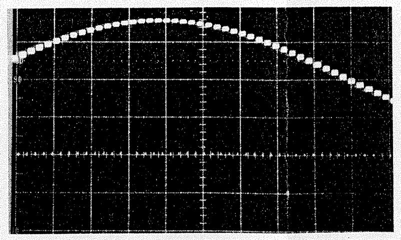
⑮ OUT L MODE : PLAY
V: 2V/div H: 200µsec/div



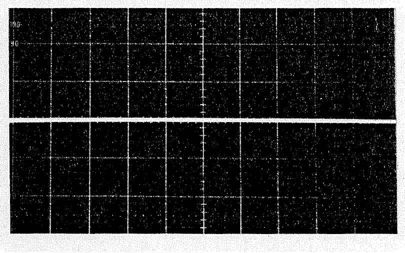
⑩ IC9-3 MODE : PLAY
V: 2V/div H: 200µsec/div



⑬ IC17-1 MODE : PLAY
V: 2V/div H: 50µsec/div

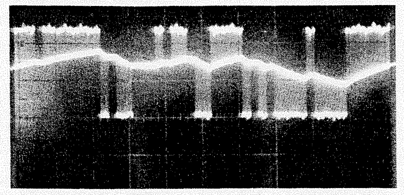


⑮ OUT L MODE : SEARCH
V: 2V/div H: 200µsec/div

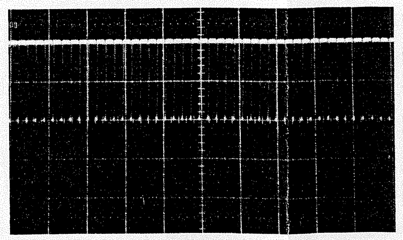


⑩ IC9-3 MODE : SEARCH
V: 2V/div H: 10m sec/div

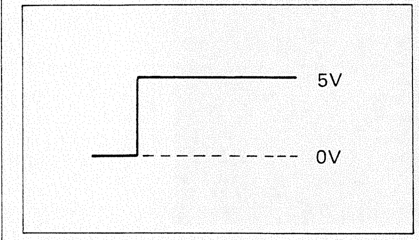
All waveforms shown here have been measured by digitizer.



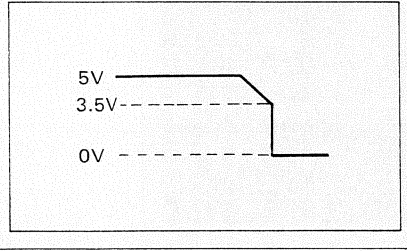
⑬ IC17-1 MODE : SEARCH
V: 2V/div H: 50µsec/div



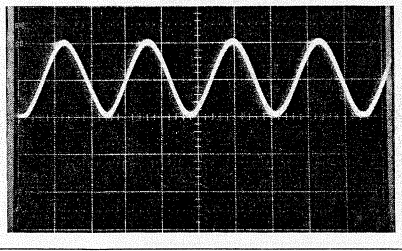
⑯

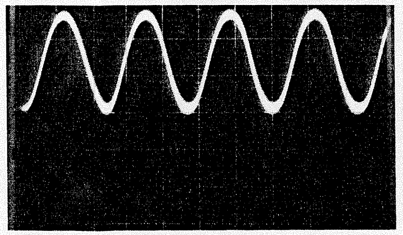


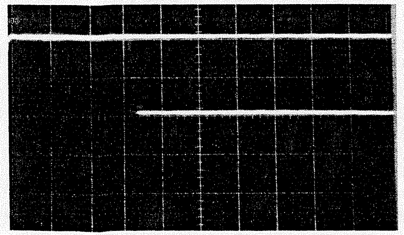
⑰ Q12-C POWER ON
V: 5V/div H: 1 sec/div

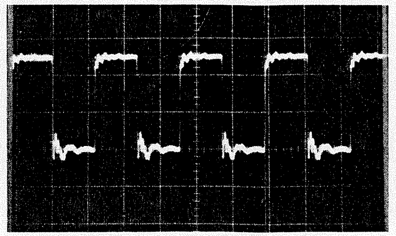


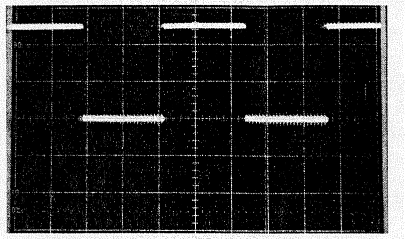
⑰ Q12-C POWER OFF
V: 5V/div H: 500m sec/div

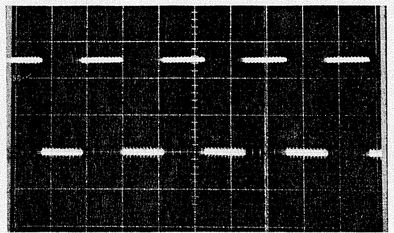

⑱ IC9-9 MODE : STOP
V: 2V/div H: 50m sec/div

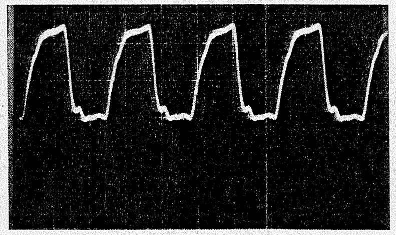

⑲ IC9-8 MODE : STOP
V: 1V/div H: 50m sec/div

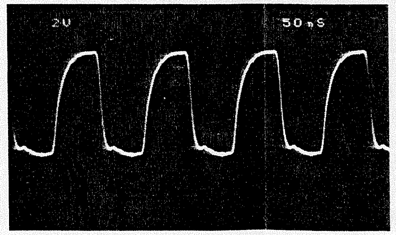

⑳ IC9-5 MODE : PLAY
V: 2V/div H: 200 sec/div


㉑ IC9-76 MODE : STOP
V: 2V/div H: 200m sec/div


㉒ IC9-80 MODE : STOP
V: 2V/div H: 5μsec/div


㉓ IC9-79 MODE : STOP
V: 2V/div H: 5μsec/div


㉔ IC9-53 MODE : STOP
V: 2V/div H: 50n sec/div



㉕ IC9-54 MODE : STOP
V: 2V/div H: 50n sec/div

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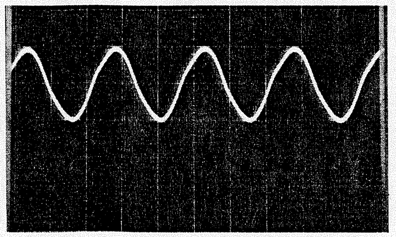
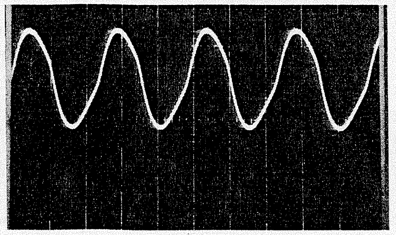
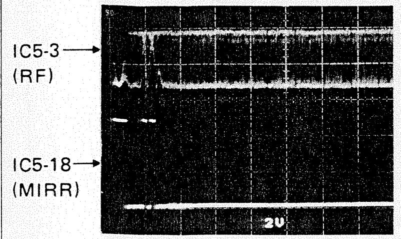
㉗


㉘ IC12-6 MODE : STOP
V: 2V/div H: 100n sec/div

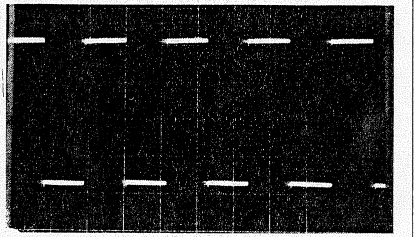

㉙ IC12-5 MODE : STOP
V: 2V/div H: 100n sec/div

㉚



㉛ IC 5-18 MODE : STOP
V: 2V/div 2m sec/div

㉜


㉝ IC15-11 MODE : STOP
V: 2V/div H: 5μsec/div

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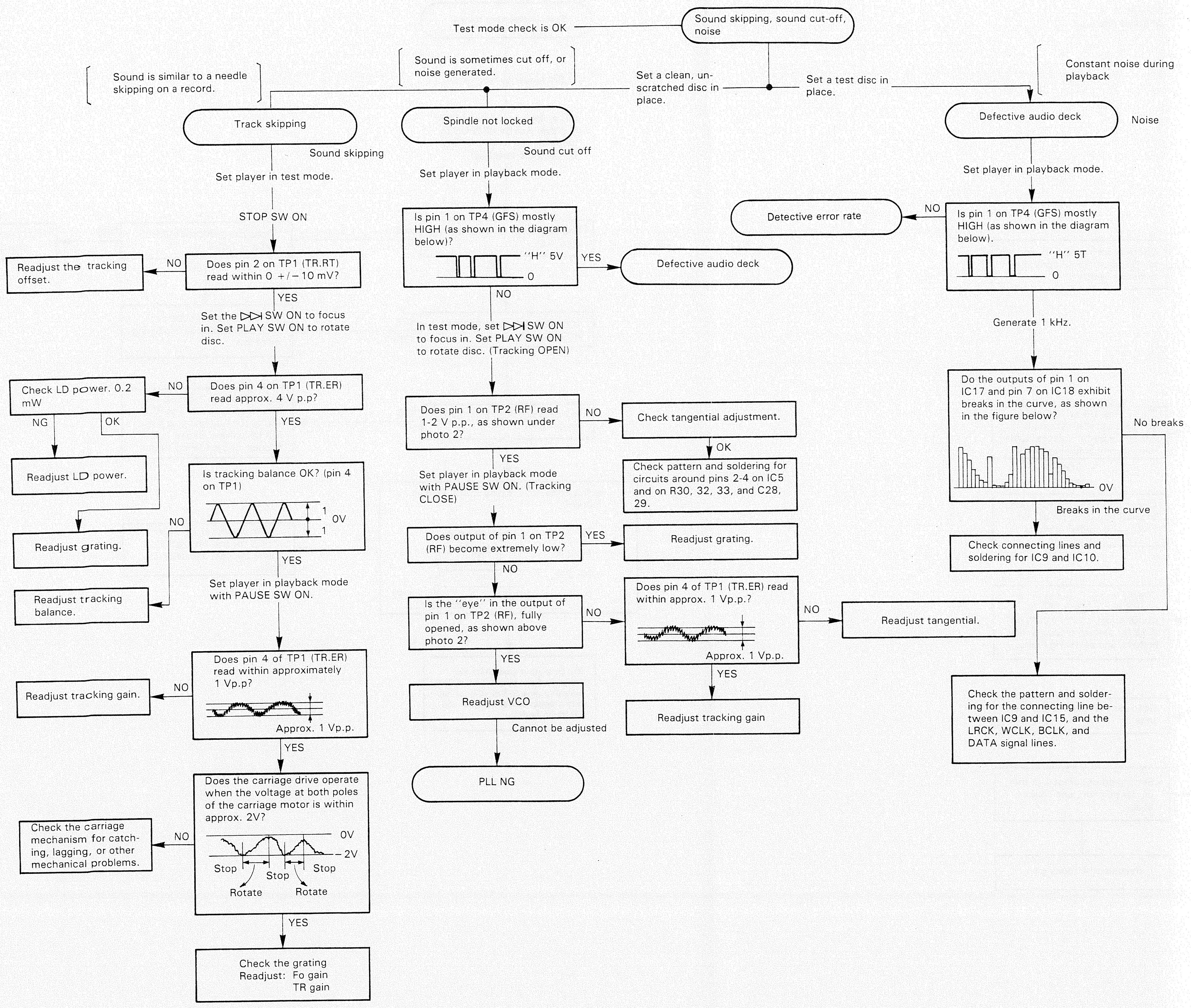
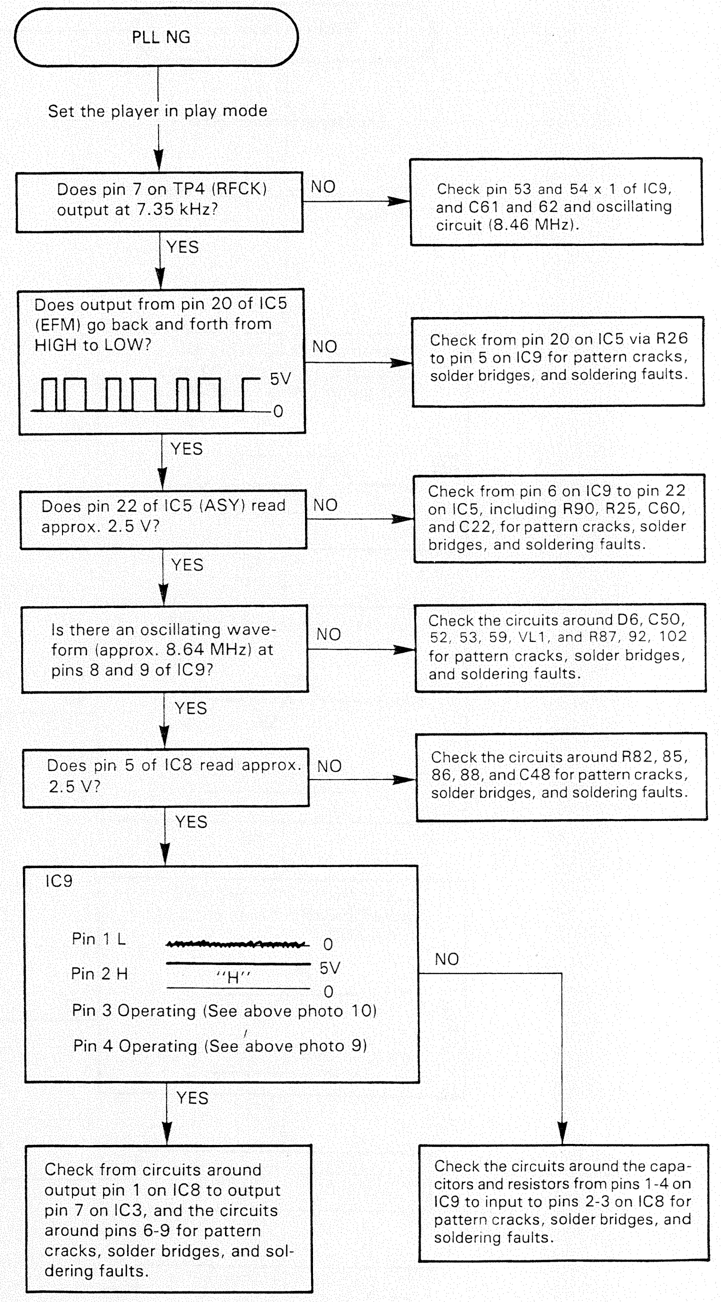
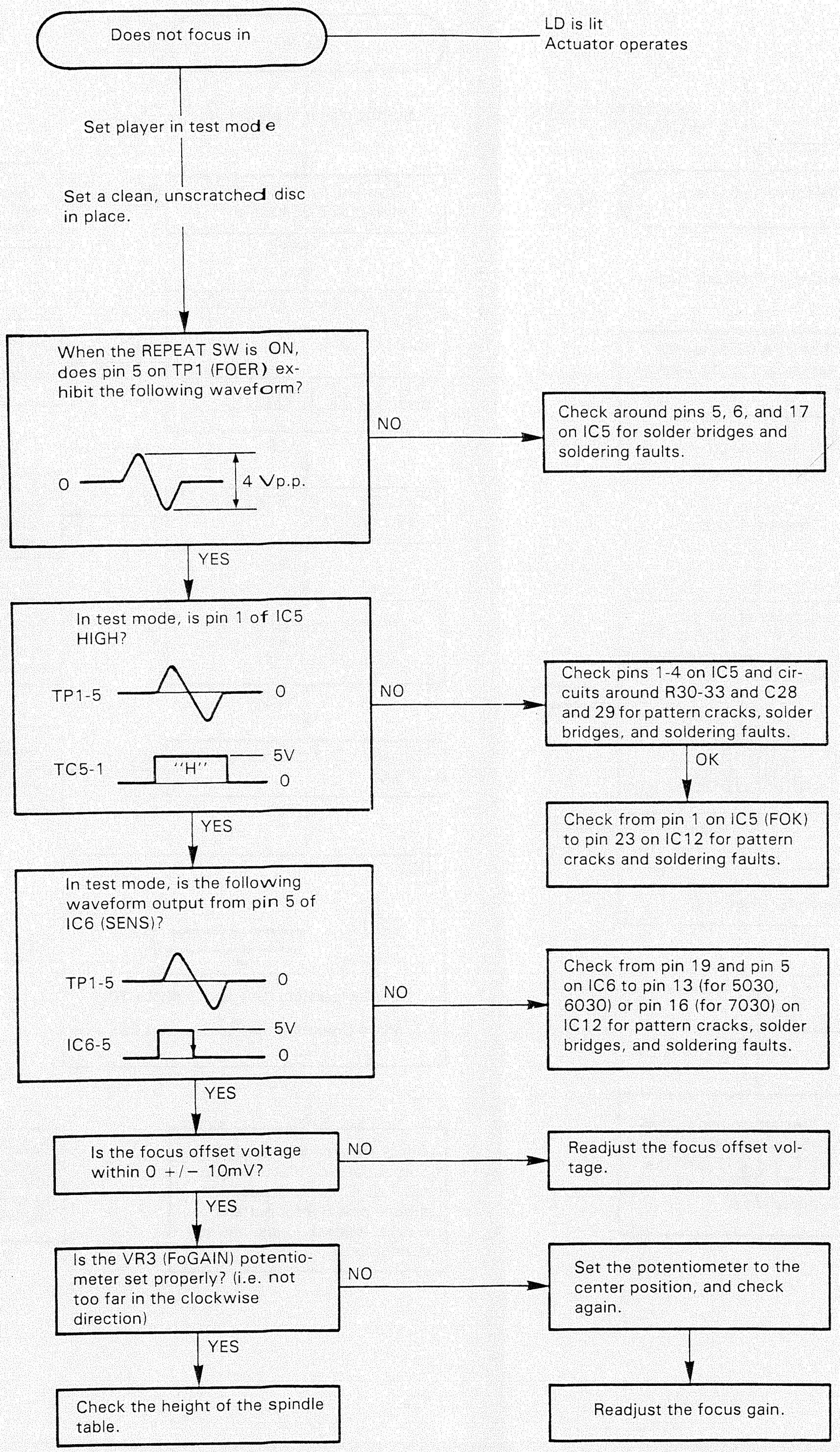
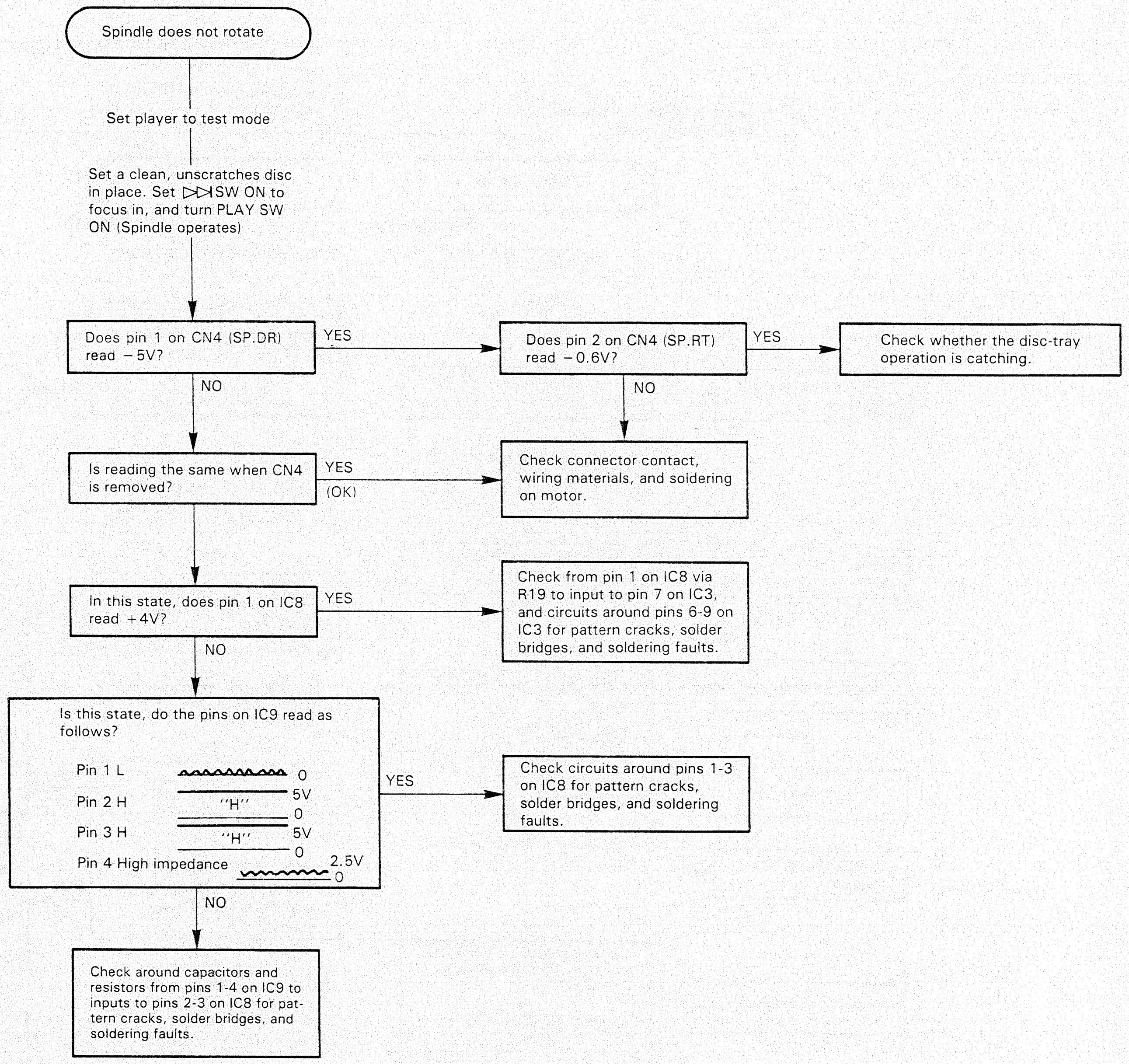
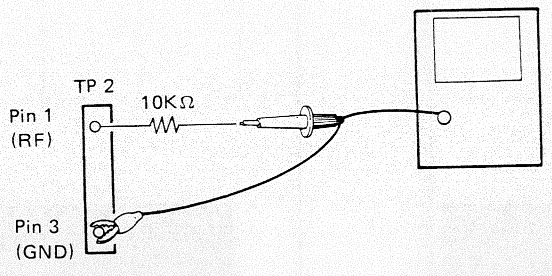
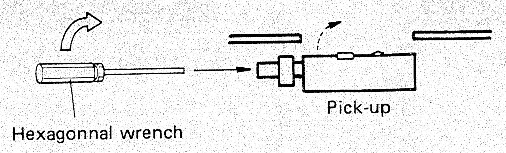

Sound skipping, sound cut-off, noise
Test mode check is OK
Sound is similar to a needle skipping on a record.
Sound is sometimes cut off, or noise generated.
Set a clean, un-scratched disc in place.
Set a test disc in place.
Constant noise during playback
Track skipping
Sound skipping
Set player in test mode.
STOP SW ON
Does pin 2 on TP1 (TR.RT) read within 0 +/−10 mV?
NO
Readjust the tracking offset.
YES
Set the ▷▷I SW ON to focus in. Set PLAY SW ON to rotate disc.
Does pin 4 on TP1 (TR.ER) read approx. 4 V p.p?
NO
Check LD power. 0.2 mW
NG
OK
Readjust LD power.
Readjust grating.
YES
Is tracking balance OK? (pin 4 on TP1)
1
0V
1
NO
Readjust tracking balance.
YES
Set player in playback mode with PAUSE SW ON.
Does pin 4 of TP1 (TR.ER) read within approximately 1 Vp.p?
Approx. 1 Vp.p.
NO
Readjust tracking gain.
YES
Does the carriage drive operate when the voltage at both poles of the carriage motor is within approx. 2V?
0V
−2V
Stop
Stop
Stop
Rotate
Rotate
NO
Check the carriage mechanism for catching, lagging, or other mechanical problems.
YES
Check the grating
Readjust: Fo gain
TR gain
Spindle not locked
Sound cut off
Set player in playback mode.
Is pin 1 on TP4 (GFS) mostly HIGH (as shown in the diagram below)?
"H" 5V
0
YES
Defective audio deck
NO
In test mode, set ▷▷I SW ON to focus in. Set PLAY SW ON to rotate disc. (Tracking OPEN)
Does pin 1 on TP2 (RF) read 1-2 V p.p., as shown under photo 2?
NO
Check tangential adjustment.
OK
Check pattern and soldering for circuits around pins 2-4 on IC5 and on R30, 32, 33, and C28, 29.
YES
Set player in playback mode with PAUSE SW ON. (Tracking CLOSE)
Does output of pin 1 on TP2 (RF) become extremely low?
YES
Readjust grating.
NO
Is the "eye" in the output of pin 1 on TP2 (RF), fully opened, as shown above photo 2?
NO
Does pin 4 of TP1 (TR.ER) read within approx. 1 Vp.p.?
Approx. 1 Vp.p.
NO
Readjust tangential.
YES
Readjust tracking gain
YES
Readjust VCO
Cannot be adjusted
PLL NG
Defective audio deck
Noise
Set player in playback mode.
Is pin 1 on TP4 (GFS) mostly HIGH (as shown in the diagram below).
"H" 5T
0
NO
Detective error rate
Generate 1 kHz.
Do the outputs of pin 1 on IC17 and pin 7 on IC18 exhibit breaks in the curve, as shown in the figure below?
0V
No breaks
Breaks in the curve
Check connecting lines and soldering for IC9 and IC10.
Check the pattern and soldering for the connecting line between IC9 and IC15, and the LRCK, WCLK, BCLK, and DATA signal lines.


PLL NG
Set the player in play mode
Does pin 7 on TP4 (RFCK) output at 7.35 kHz?
NO
Check pin 53 and 54 x 1 of IC9, and C61 and 62 and oscillating circuit (8.46 MHz).
YES
Does output from pin 20 of IC5 (EFM) go back and forth from HIGH to LOW?
5V
0
NO
Check from pin 20 on IC5 via R26 to pin 5 on IC9 for pattern cracks, solder bridges, and soldering faults.
YES
Does pin 22 of IC5 (ASY) read approx. 2.5 V?
NO
Check from pin 6 on IC9 to pin 22 on IC5, including R90, R25, C60, and C22, for pattern cracks, solder bridges, and soldering faults.
YES
Is there an oscillating waveform (approx. 8.64 MHz) at pins 8 and 9 of IC9?
NO
Check the circuits around D6, C50, 52, 53, 59, VL1, and R87, 92, 102 for pattern cracks, solder bridges, and soldering faults.
YES
Does pin 5 of IC8 read approx. 2.5 V?
NO
Check the circuits around R82, 85, 86, 88, and C48 for pattern cracks, solder bridges, and soldering faults.
YES
IC9
Pin 1 L
0
Pin 2 H
"H"
5V
0
Pin 3 Operating (See above photo 10)
Pin 4 Operating (See above photo 9)
NO
YES
Check from circuits around output pin 1 on IC8 to output pin 7 on IC3, and the circuits around pins 6-9 for pattern cracks, solder bridges, and soldering faults.
Check the circuits around the capacitors and resistors from pins 1-4 on IC9 to input to pins 2-3 on IC8 for pattern cracks, solder bridges, and soldering faults.


Does not focus in
LD is lit
Actuator operates
Set player in test mode
Set a clean, unscratched disc in place.
When the REPEAT SW is ON, does pin 5 on TP1 (FOER) exhibit the following waveform?
0
4 Vp.p.
NO
Check around pins 5, 6, and 17 on IC5 for solder bridges and soldering faults.
YES
In test mode, is pin 1 of IC5 HIGH?
TP1-5
0
TC5-1
"H"
5V
0
NO
Check pins 1-4 on IC5 and circuits around R30-33 and C28 and 29 for pattern cracks, solder bridges, and soldering faults.
OK
Check from pin 1 on IC5 (FOK) to pin 23 on IC12 for pattern cracks and soldering faults.
YES
In test mode, is the following waveform output from pin 5 of IC6 (SENS)?
TP1-5
0
IC6-5
5V
0
NO
Check from pin 19 and pin 5 on IC6 to pin 13 (for 5030, 6030) or pin 16 (for 7030) on IC12 for pattern cracks, solder bridges, and soldering faults.
YES
Is the focus offset voltage within 0 +/− 10mV?
NO
Readjust the focus offset voltage.
YES
Is the VR3 (FoGAIN) potentiometer set properly? (i.e. not too far in the clockwise direction)
NO
Set the potentiometer to the center position, and check again.
Readjust the focus gain.
YES
Check the height of the spindle table.


Spindle does not rotate
Set player to test mode
Set a clean, unscratches disc in place. Set ▷▷| SW ON to focus in, and turn PLAY SW ON (Spindle operates)
Does pin 1 on CN4 (SP.DR) read −5V?
YES
Does pin 2 on CN4 (SP.RT) read −0.6V?
YES
Check whether the disc-tray operation is catching.
NO
Check connector contact, wiring materials, and soldering on motor.
NO
Is reading the same when CN4 is removed?
YES
(OK)
In this state, does pin 1 on IC8 read +4V?
YES
Check from pin 1 on IC8 via R19 to input to pin 7 on IC3, and circuits around pins 6-9 on IC3 for pattern cracks, solder bridges, and soldering faults.
NO
Is this state, do the pins on IC9 read as follows?
Pin 1 L
0
Pin 2 H
"H"
5V
0
Pin 3 H
"H"
5V
0
Pin 4 High impedance
2.5V
0
YES
Check circuits around pins 1-3 on IC8 for pattern cracks, solder bridges, and soldering faults.
NO
Check around capacitors and resistors from pins 1-4 on IC9 to inputs to pins 2-3 on IC8 for pattern cracks, solder bridges, and soldering faults.

Step No.	Oscilloscope position		Test points	Adjustment positions	Check items/ Adjustment specifications	Adjustment procedure
	V	H				
6	TANGENTIAL ADJUSTMENT					
		200nS	TP2 pin 1 (RF output)	Tangential adjustment screw	Best eye pattern	- Load the test disc. - Set the player to test mode (see page 51). - Using the MANUAL SEARCH FWD key (▷), move the pick-up to the disc edge to enable the tangential adjustment screw to be seen from the left hand side (see Figure 11-5). - Press the TRACK FWD (▷▷|), PLAY (▷), and PAUSE (❙❙) keys in that order to close all servos, (The PAUSE indicator will light up.) - Observe the TP2 pin 1 RF (RF output) in the oscilloscope and adjust the tangential adjustment screw to obtain the clearest eye pattern. (Figure 11-5). - The optimum position is the midpoint between the two positions where the eye pattern starts to deteriorate when the tangential adjustment screw is turned clockwise and counter clockwise. Guidelines for this adjustment: In addition to a clear overall waveform, adjust to obtain relatively slender lines (see photograph 11-8) Where single "diamond" shapes are formed in the eye pattern. - To make the waveform easier to observe, insert a 10 Kohm resistance (or 5 Kohm if the waveform is hard to see) in the tip of the probe as shown in Figure 11-4.  Fig. 11-4 *Note: When making adjustments, lift the pick up unit a little with a hexagonal wrench so that it can't fall down.* 

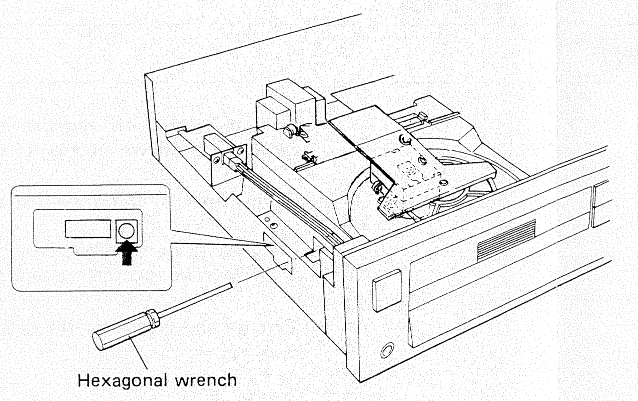
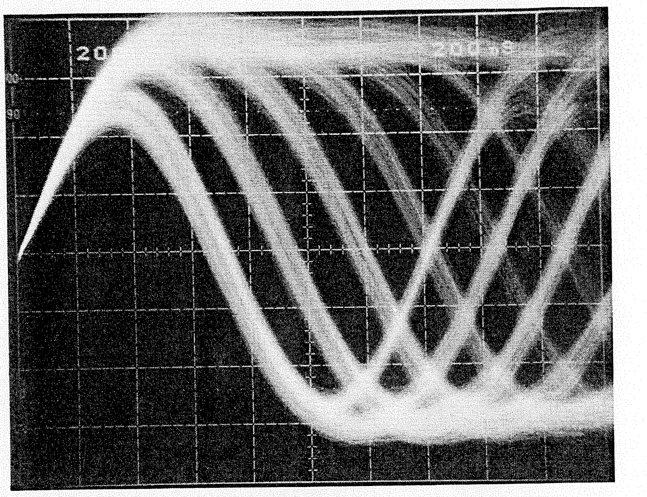
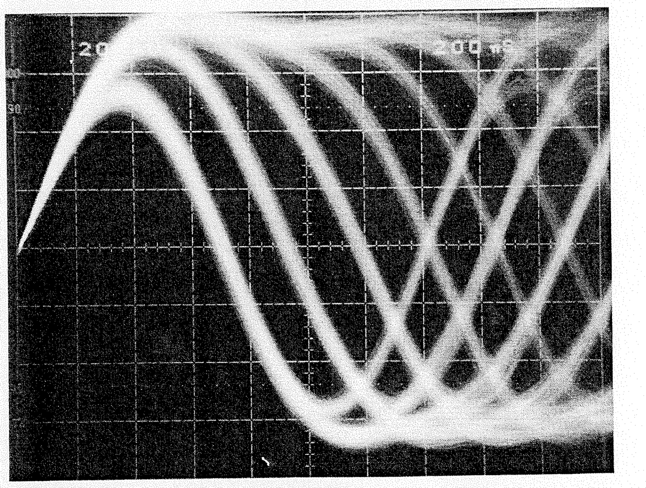


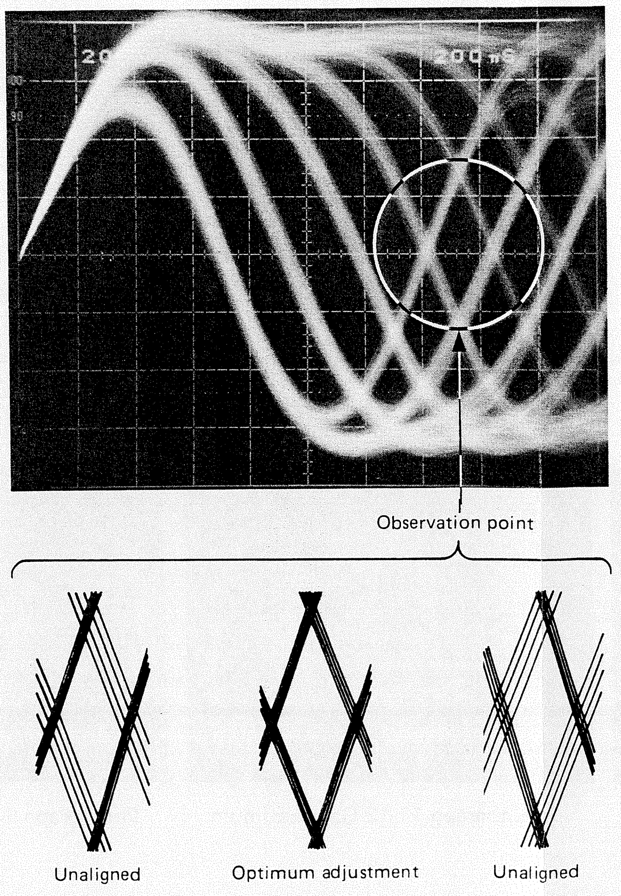
Fig. 11-5 Tangential Adjustment



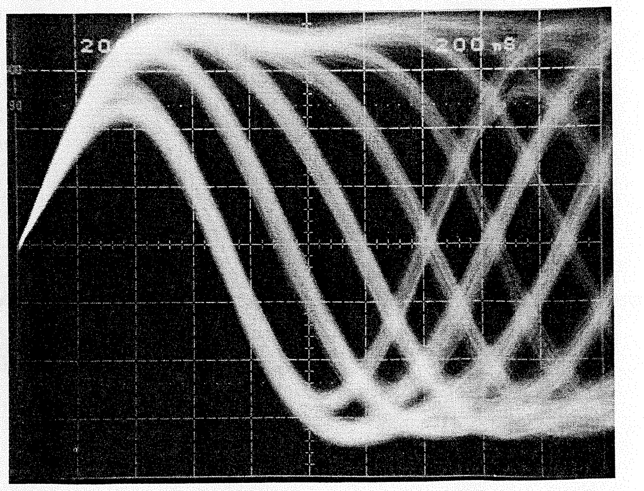
Photograph 11-9



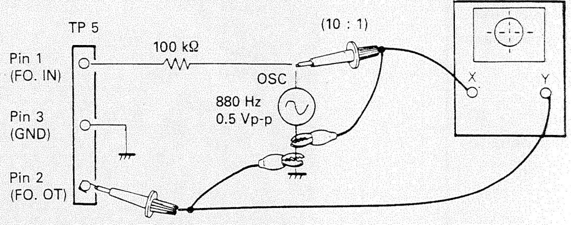
Photograph 11-10

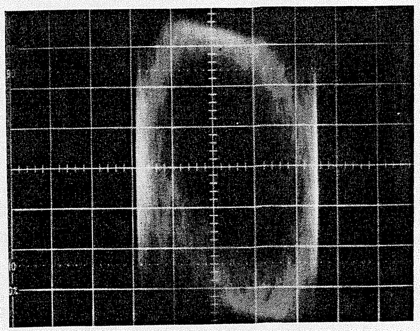


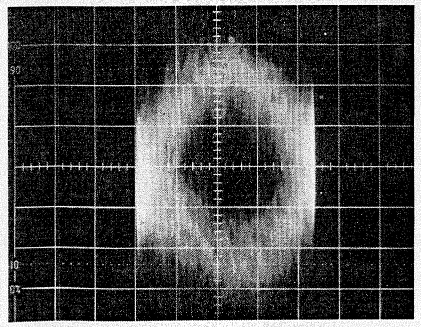
Photograph 11-8

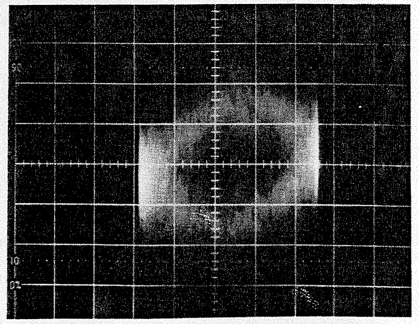


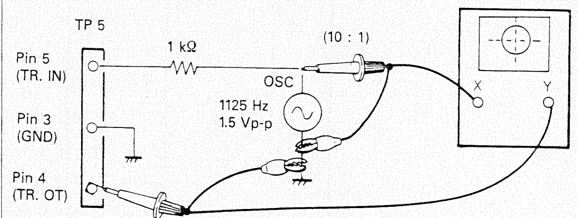
Photograph 11-11

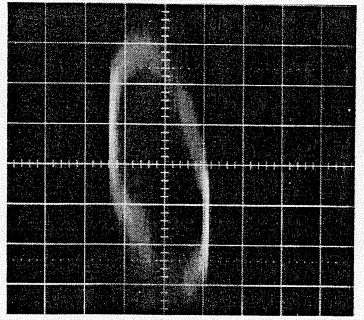
Step No.	Oscilloscope position V	Oscilloscope position H	Test points	Adjustment positions	Check items/ Adjustment specifications	Adjustment procedure
7	FOCUS GAIN ADJUSTMENT					
	20mV/div./5mV/div. CH1(X), CH2(Y) (Probe 10 : 1)		X-axis TP 5 Pin 1 (FO. IN) Y-axis TP 5 Pin 2 (FO. OT)	VR3 (FO. GA)	Phase difference 90°	• Turn the power off and connect the oscilloscope and oscillator as shown in Fig. 11-6. • Set the player to test mode (see page 51). • Press the TRACK FWD (▷▷⏐), PLAY (▷), and PAUSE (▯▯) keys in that order to switch all servos on. • Turn on the power for the oscillator and output 880Hz 0.5Vp-p. *NOTE:* *Since there are cases where DC is output by the oscillator during POWER ON, it is advisable to connect OSC after turning the power on.* • Adjust the VR3 FO. GA (FOCUS GAIN) VOLUME until the Lissajous' wave shape on the oscilloscope assumes a horizontal round shape (phase difference 90°).  TP 5 Pin 1 (FO. IN) Pin 3 (GND) Pin 2 (FO. OT) 100 kΩ (10 : 1) OSC 880 Hz 0.5 Vp-p X Y (10 : 1) Fig. 11-6

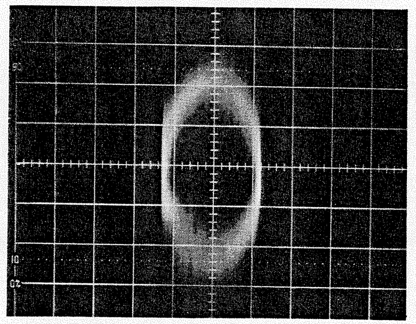

Photograph 11-12 Gain too large

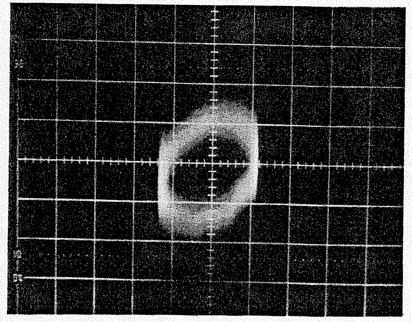

Photograph 11-13 Gain optimum

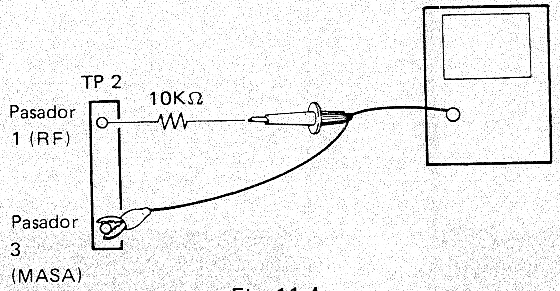
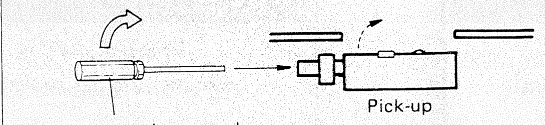

Photograph 11-14 Gain too small

Step No.	Oscilloscope position V	Oscilloscope position H	Test points	Adjustment positions	Check items/ Adjustment specifications	Adjustment procedure
8	TRACKING ADJUSTMENT					
	50mV/div./10mV/div. CH1(X), CH2(Y) (Probe 10 : 1)		X-axis TP 5 Pin 5 (TR. IN) Y-axis TP 5 Pin 4 (TR. OT)	VR4 (TR. GA)	Phase difference 90°	• Turn the power off and connect the oscilloscope and oscillator as shown in Fig. 11-7. • Set the player to test mode (see page 51). • Press the TRACK FWD (▷▷⏐), PLAY (▷), and PAUSE (▯▯) keys in that order to switch all servos on. • Turn on the power for the oscillator and output 1125Hz 1.5Vp-p. *NOTE:* *Since there are cases where DC is output by the oscillator during POWER ON, it is advisable to connect OSC after turning the power on.* • Adjust the VR4 TR. GA (TRACKING GAIN) VOLUME until the Lissajous' wave shape on the oscilloscope assumes a horizontal round shape (phase difference 90°).  TP 5 Pin 5 (TR. IN) Pin 3 (GND) Pin 4 (TR. OT) 1 kΩ (10 : 1) OSC 1125 Hz 1.5 Vp-p X Y (10 : 1) Fig. 11-7


Photograph 11-15 Gain too large


Photograph 11-16 Gain optimum


Photograph 11-17 Gain too small

No. de paso	Posición del osciloscopio		Puntos de chequeo	Posiciones de ajuste	Items de verificación/ Especificaciones de ajuste	Procedimiento de ajuste
	V	H				
6	AJUSTE TANGENCIAL					
		200nS	TP2 Pasador 1 (Salida RF)	Tornillo de ajuste tangencial	Mejor patrón de vista	• Cargar el disco de prueba. • Colocar el tocadiscos en el mode de prueba (véase la página 73). • Mover el fonocaptor al borde del disco usando la tecla MANUAL SEARCH FWD (▷), para permitir que el tornillo de ajuste tangential se vea desde el lado izquierdo (véase la Figura 11-5). • Presionar las teclas TRACK FWD (▷▷I), PLAY (▷) y PAUSE (▯▯) para cerrar todos los servos. (Se encenderá el indicador de pausa.) • Observar el TP2 pasador 1 RF (salida RF) en el osciloscopio, y ajustar mediante el tornillo de ajuste tangencial para obtener el patrón de vista más claro. (Fig. 11-5.) • La posición óptima es el punto medio entra las dos posiciones donde el patrón de vista comienza a deteriorarse cuando el tornillo de ajuste tangencial se gira en el sentido de los punteros de reloj y en el sentido contrario. Guías para el ajuste: Además de una formade onda general clara, se debe ajustar para obtener líneas relativamente finas (véase la fotografía 11-5), donde se observan formas de "diamante" simple en el patrón de vista. • Para facilitar la observación de la forma de onda más fácil de observar, insertar una resistencia de 10 Kohm (o 5 Kohm si la forma de onda es difícil de distinguir) en la punta del probador, como se indica en la Figura 11-4.  Fig. 11-4 *Nota: Para realizar los ajustes, levante ligeramente la unidad captora con una llave hexagonal de forma que no pueda caerse.* 

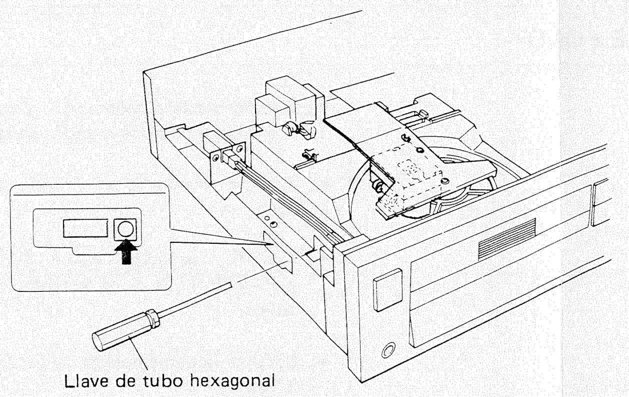
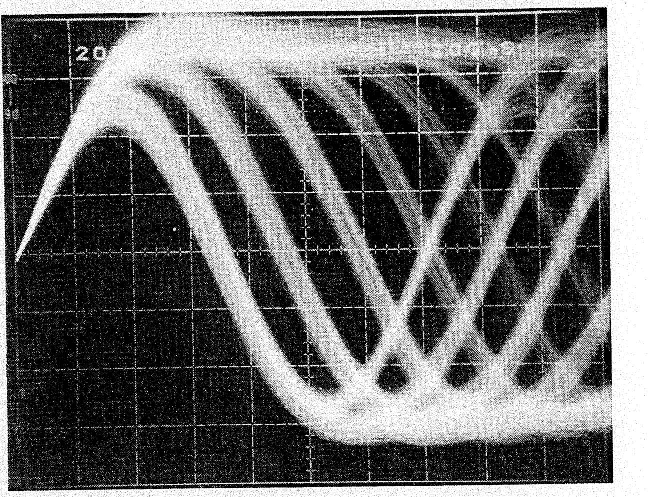
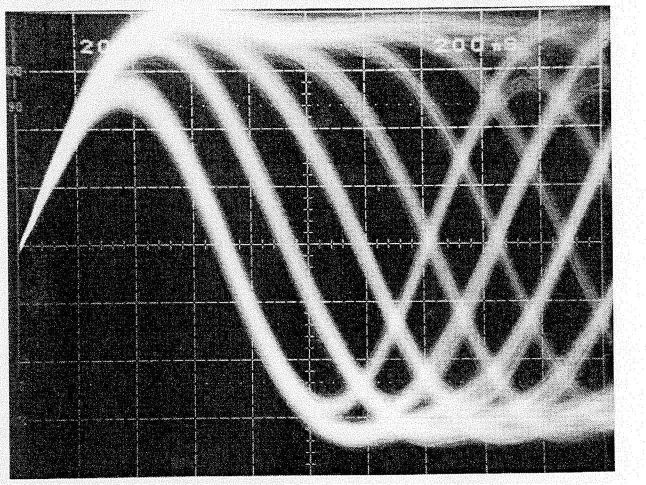


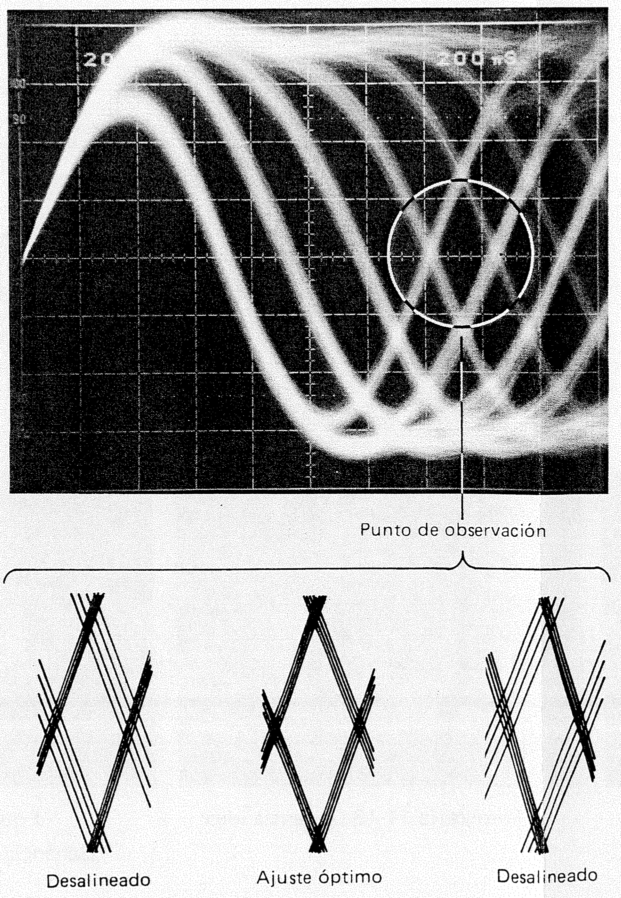
Fig. 11-5 Ajuste tangencial



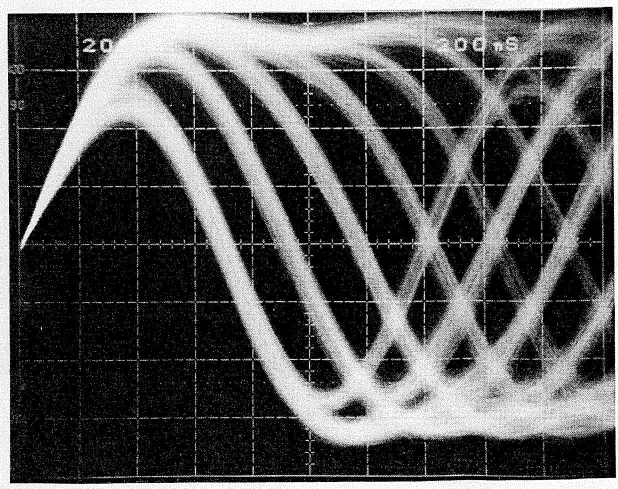
Fotografía 11-9



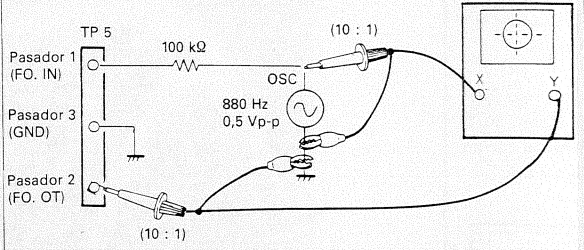
Fotografía 11-10

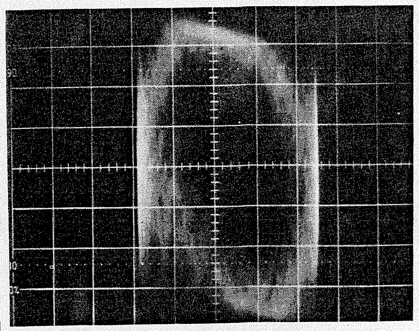


Fotografía 11-8

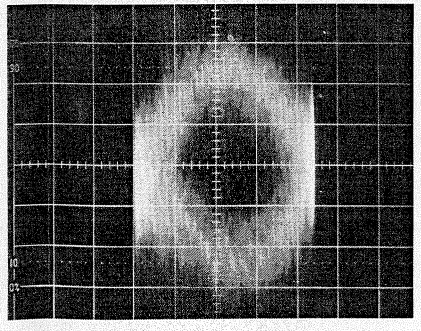


Fotografía 11-11

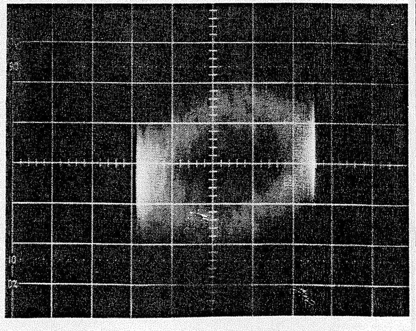
No. de paso	Posición del osciloscopio V	Posición del osciloscopio H	Puntos de chequeo	Posiciones de ajuste	Items de verificación/ Especificaciones de ajuste	Procedimiento de ajuste
7	AJUSTE DE GANANCIA DE FOCO					
	20mV/div./5mV/div. Canal1(X), Canal2(Y) (Sonda 10 : 1)		Eje X TP 5 Pasador 1 (FO. IN) Eje Y TP 5 Pasador 2 (FO. OT)	VR 3 (FO. GA)	Diferencia de fase de 90°	• Desconecte la alimentación, y conecte el osciloscopio y el oscilador como se muestra en la figura 11-6. • Poner el tocadiscos en el modo de prueba (véase la página 73). • Presionar las teclas TRACK FWD (▷▷|), PLAY (▷) y PAUSE (▯▯) en el orden para encender todos los servos. • Conecte la alimentación del oscilador y ajústelo a 880 Hz, 0,5Vp-p. *Nota: Como se puede dar el caso de que al conectar la alimentación, el oscilador dé salida a CC, se aconseja conectar dicho oscilador después de haber conectado la alimentación.* • Ajuste el control VR3 FO.GA (ganancia de enfoque) hasta que la figura de Lissajous del osciloscopio asuma una forma redonda horizontal (diferencia de fase de 90°).  TP 5 Pasador 1 (FO. IN) Pasador 3 (GND) Pasador 2 (FO. OT) 100 kΩ OSC 880 Hz 0,5 Vp-p (10 : 1) (10 : 1) X Y Fig. 11-6



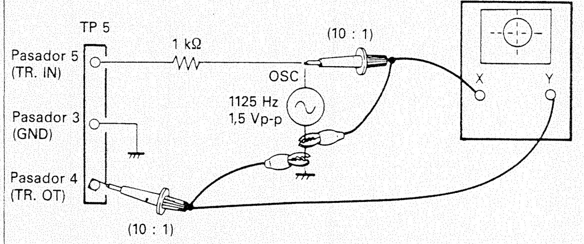
Fotografía 11-12
Ganancia demasiado grande

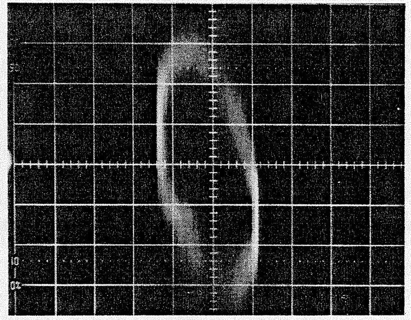


Fotografía 11-13 Ganancia ideal

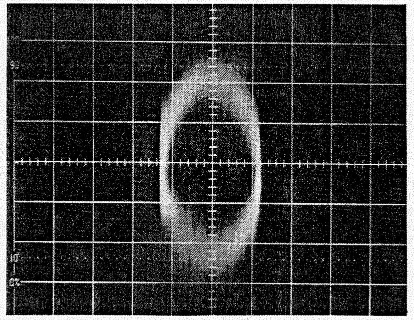


Fotografía 11-14
Ganancia demasiado pequeña

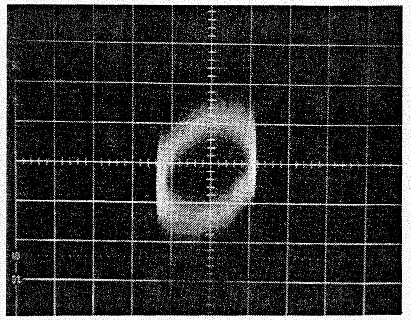
No. de paso	Posición del osciloscopio V	Posición del osciloscopio H	Puntos de chequeo	Posiciones de ajuste	Items de verificación/ Especificaciones de ajuste	Procedimiento de ajuste
8	AJUSTE DE GANANCIA DE ALINEACION					
	50mV/div./10mV/div. Canal1(X), Canal2(Y) (Sonda 10 : 1)		Eje X TP 5 Pasador 4 (TR. IN) Eje Y TP 5 Pasador5 (TR. OT)	VR 4 (TR. GA)	Diferencia de fase de 90°	• Desconecte la alimentación, y conecte el osciloscopio y el oscilador como se muestra en la figura 11-7. • Colocar el tocadiscos en el modo de prueba (véase página 73). • Presionar las teclas TRACK FWD (▷▷|), PLAY (▷)y PAUSE (▯▯) en el orden para encender todos los servos. • Conecte la alimentación del oscilador y ajústelo a 1125 Hz, 1,5Vp-p. *Nota: Como se puede dar el caso de que al conectar la alimentación, el oscilador dé salida a CC, se aconseja conectar dicho oscilador después de haber conectado la alimentación.* • Ajuste el control VR4 TR.GA (ganancia de sequimiento) hasta que la figura de Lissajous del oscilloscopio asuma una forma redonda horizontal (diferencia de fase de 90°).  TP 5 Pasador 5 (TR. IN) Pasador 3 (GND) Pasador 4 (TR. OT) 1 kΩ OSC 1125 Hz 1,5 Vp-p (10 : 1) (10 : 1) X Y Fig. 11-7



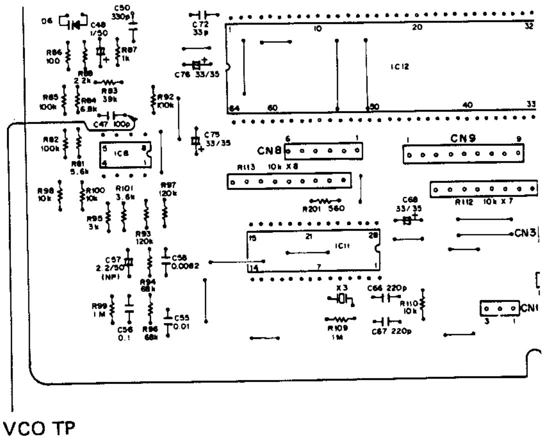
Fotografía 11-15
Ganancia demasiado grande



Fotografía 11-16 Ganancia ideal



Fotografía 11-17
Ganancia demasiado pequeña

Step No.	Oscilloscope position		Test points	Adjustment positions	Check items/ Adjustment specifications	Adjustment procedure
	V	H				
9	**VCO FREE–RUN FREQUENCY ADJUSTMENT**					
						• Set the player to test mode (see page 51). • Press the STOP Key (□) to switch all servos off. • Press the TRACK FWD (▷▷|) and PLAY (▷) keys in that order to close the focus and spindle servos.
	0.5V/div	5mS/div.	IC 7 (2/2) Pin 7		Write the Center Value of the Waveform	• Observe the waveform at pin 7 of IC7 (2/2) by oscilloscope at this time. (V: 0.5V/div.) (Although C47, R83, R87, and other circuit elements are connected to pin 7, the waveform can be easily observed if observed at (VCO. TP) (See Figure 11-8). • Write the center value of the waveform at pin 7 of IC7 (2/2).
	0.5V/div	5mS/div.	IC 7 (2/2) Pin 7	VL 1 (VCO coil)		• Using the core driver, adjust the VL1 (VCO coil) core so that the center value of the oscilloscope waveform is the same as the previously recorded value when the PAUSE key (▯▯) is pressed to switch the tracking servo on.  IC12 IC11 IC8 CN8 CN9 CN3 CN1 X3 VCO TP Fig. 11-8

11. RÉGLAGE

Les réglages du lecteur de disque compact s'effectuent de la manière suivante:

• Items de Réglage

1. Réglages de décalage d'alignement et de mise au point
2. Vérification de la puissance du LD (diode au laser)
3. Réglage de varrouillage de mise au point et de l'axe
4. Réglage de la mire
5. Réglage de l'équilibre d'alignement
6. Réglage tangentiel
7. Réglage du gain de mise au point
8. Réglage du gain d'alignement
9. Réglage de la fréquence de fonctionnement libre VCO

• Equipement de mesure

1. Oscilloscope de trace double
2. Indicateur de puissance optique
3. Disque d'essai (YEDS7)
4. Filtres de réglage de mise au point et d'alignement
5. Filtre passe-bande de réglage du gain de boucle
6. Générateur de signal
7. Tournevis de mire
8. Autres équipements de mesure d'usage courant

• Mode d'essai

Les réglages du lecteur de disque s'effectuent en mode d'essai.

Procédures de réglage et d'annulation du mode d'essai

(1) Mettre en route le commutateur POWER (ALIMENTATION) (S401) tout en pressant le commutateur TEST MOE (MODE D'ESSAI) (SI).
(2) Puis, mettre en route le commutateur MANUAL SEARCH FWD (RECHERCHE MANUELLE EN AVANT) (◁◁) ou le commutateur REV (MARCHE ARRIERE) (▷▷) pour mettre enfonction le mode d'essai.
(3) Le mode d'essai est annulé en mettant hors de service le commutateur POWER.

Les diverses fonctions des touches au cours du mode d'essai sont indiquées dans le tableau 11-1.

• Commandes de Réglage

VR7: Décalage d'alignement (TR, OF)
VR3: Gain de mise au point (FO, GA)
VR4: Gain d'alignement (TR.GA)
VR5: Equilibre d'alignement (TR.BL)
VR6: Décalage de mise au point (FO/OF)
VL1: Fonctionnement libre VCO (bobine VCO)

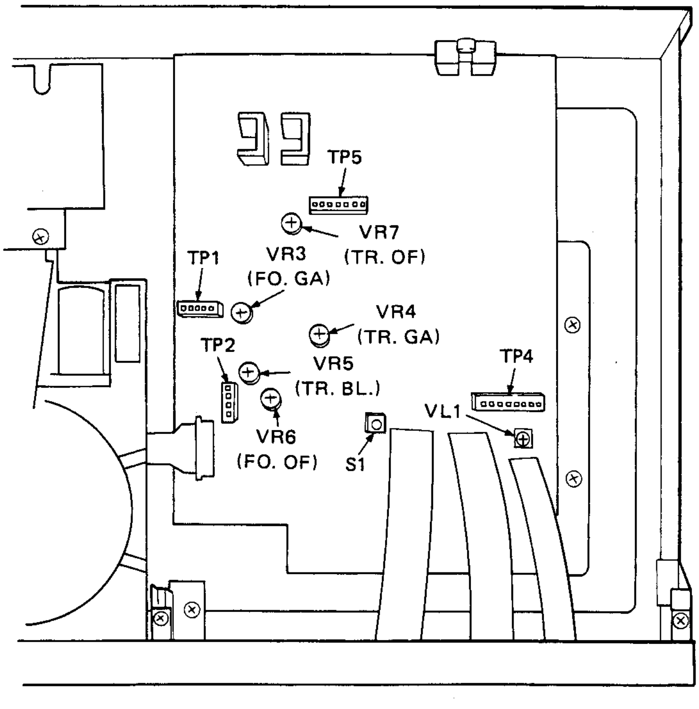
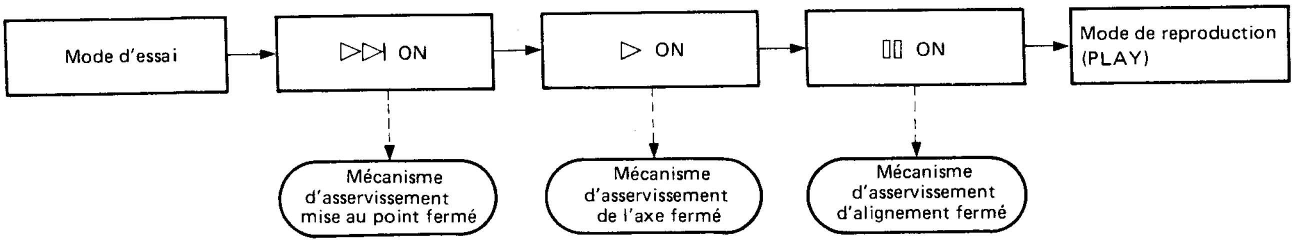


Fig. 11-1 Points de réglage

Au cours du mode d'essai, chaque mécanisme d'asservissement peut être fermé ou ouvert à travers des opérations différentes. Par conséquent, chaque mécanisme d'asservissement doit être fermé un à la fois (en séquence de série) pour régler le mode de reproduction. Il faudrait remarquer que le mode de reproduction n'est pas mis en fonction en pressant tout simplement la touche de PAUSE (▯▯) au cours du mode d'essai.

Exemple: Commuter du mode d'arrêt au mode de reproduction.


Mode d'essai
▷▷| ON
▷ ON
▯▯ ON
Mode de reproduction (PLAY)
Mécanisme d'asservissement mise au point fermé
Mécanisme d'asservissement de l'axe fermé
Mécanisme d'asservissement d'alignement fermé

- Les mécanismes d'asservissement fonctionnent conformément à la séquence de série au cours du mode d'essai.

- **Fonctions des touchs en mode d'essai**

Symbole	Touche	Fonction durant le mode d'essai	Description
▷▷|	TRACK FWD (Alignement en avant)	Mécanisme asservissement fermé	La diode laser s'allume, l'actionneur de mise au point se déplace vers le haut/le bas, et le mécanisme d'asservissement de mise au point se ferme.
▷	PLAY (Reproduction)	Mécanisme d'asservissement fermé	Mécanisme d'asservissement fermé en mode CLV-A après avoir démarré de moteur de l'axe.
▯▯	PAUSE	Mécanisme d'asservissement d'alignement fermé/ouvert	Le mécanisme d'asservissement se ferme en pressant le tumbler et le lecteur est commuté en mode de reproduction (avec les mécanismes d'asservissement de mise au point et de l'axe fermés). Le voyant PAUSE s'allume et le mécanisme d'asservissement est ouvert en pressant une deuxième fois.
◁◁	MANUAL SEARCH REV (Recherche manuelle en marche arrière)	Marche arrière du chariot (vers le centre du disque	Le chariot est déplacé vers le centre du disque à une vitesse élevée d'environ 1 cm/seconde. Comme il n'y a aucun mécanisme de sécurité pour arrêter le chariot, ne pas le déplacer trop loin.
▷▷	MANUAL SEARCH FWD (Recherche manuelle en avant)	Marche avant du chariot (vers le bord du disque)	Le chariot se déplace vers le bord du disque à une vitesse élevée d'environ 1 cm/seconde. Comme il n'y a aucun mécanisme de sécurité pour arrêter le chariot, ne pas le déplacer trop loin.
▭	REPEAT (Répétition)	L'objectif se déplace vers le haut/le bas.	La diode laser s'allume, et l'actionneur de mise au point est déplacé vers le haut/vers le bas. Le mécanisme d'asservissement de mise au point n'est pas fermé.
□	STOP (Arrêt)	Arrêt	Tous les mécanisme d'asservissement sont arrêtés et réenclenchés à l'état d'origine.
⏏	OUVERT/FERME	(Plateau de disque)	Le plateau de disque est ouvert/fermé. Il faudrait remarquer que le pick-up ne retourne pas sur le support du bras de pick-up quand le plateau est ouvert, et reste sur la même position lorsque le plateau est fermé.

Tableau 11-1

No. d'étape	Position de l'oscilloscope		Points d'essai	Positions de réglage	Items de contrôle/ Spécifications de réglage	Procédure de réglage
	V	H				
1	**REGLAGES DE DECALAGE D'ALIGNEMENT ET DE MISE AU POINT**					
						• Régler le lecteur en mode d'essai (se référer à la page 62).
			TP1 Broche 2 (FO.ER)	VR 7 (TR. OF)	0V ± 10mV	• Régler la tension sur TP1 broche 2 TR.RT (retour d'alignement) à une valeur de 0 V ± 10 mV en tournant la commande de VR7 TR.OF (décalage d'alignement).
			TP1 Broche 5 (TR.RT)	VR 6 (FO.OF)	0V ± 10mV	• Régler la tension sur TP1 broche 5 FO.ER (erreur de mise au point) sur une valeur de 0 V ± 10 mV en tournant la commande de VR6 FO.OF (décalage de mise au point).
						Note: Lors de l'ajustement de VR7, faire attention à ne pas créer un cours circuit entre VR7 et le radiateur IC7 (prendre la précaution d'isoler le tournevis).
2	**VERIFICATION DE LA PUISSANCE DU LD (DIODE AU LASER)**					
						• Régler en mode d'essai. (Le mode normal peut être réglé en mettant l'interrupteur d'alimentation en et hors service).
					Valeur nominale spécifiée	• Placer le senseur de compteur de puissance optique juste au-dessus de l'objectif.
						• Presser la touche de reproduction PLAY sans charger de disque et vérifier si la valeur indiquée de puissance de la LD (diode au laser) du compteur de puissance optique se trouve dans les limites spécifiées (0,21 mW ± 0.02 mW).
						• Après avoir ajusté LD POWER, reproduire le disque d'essai YEDS7 TEST DISC et mesurer la tension cc de la forme d'onde RF.
						• Si la tension de la forme d'onde RF est spérieure à 1,5 volts, réajuster LD POWER pour l'amener à 1,5 volts.
3	**VERIFICATIONS DEVERROUILLAGE DE MISE AU POINT ET DE L'AXE**					
						• Charger le disque d'essai.
						• Régler le lecteur en mode d'essai (se référer à la page 62).
						• Presser la touche MANUAL SEARCH FWD pour déplacer le pick-up à proximité du centre du disque. Il faudrait noter que cette étape devrait être exécutée.
	V 0,5 V/div.	H 100ms/ div.	TP2 Broche 1 (sortie RF)		Sortie RF générée	• Observer TP2 Broche 4 RF (sortie RF) au moyen de l'oscilloscope pour vérifier si un signal de sortie RF est généré lorsque la touche TRACK FWD (▷▷I) est pressée.
					Rotation normale	• Presser la touche PLAY (▷) et vérifier si le disque tourne à une vitesse normale (environ 300 tours/minute à proximité du centre du disque) dans la direction correcte (dans le sens des aiguilles d'une montre).

No. d'étape	Position de l'oscilloscope V	Position de l'oscilloscope H	Points d'essai	Positions de réglage	Items de contrôle/ Spécifications de réglage	Procédure de réglage
4	**REGLAGE DE LA MIRE**					
			TP1 Broche 4 (TR.ER)	Mire	Point NULL	• Déposer le plateau en enlevant les deux vis. • Ouvrir le coupleur électronique et placer un disque. • Régler le lecteur en mode d'essai (se référer à la page 62). • Presser les touches TRACK FWD (▷▷I) et PLAY (▷) selon cet ordre pour fermer les mécanisme d'asservissement de mise au point et de l'axe (en laissant ouvert le mécanisme d'asservissement d'alignement). • En utilisant la touche MANUAL SEARCH FWD (▷▷), déplacer e pick-up à proximité du externe du disque, et veiller à ce que le tournevis de la ⊖ puisse passer à travers le trou de réglage de la mire du pick-up à partir du haut de l'appareil en déplçant le pick-up. (Se référer à la figure 11-3). • Observer la forme d'ondes de TP1 Broche 4 TR.ER (erreur d'alignement) au moyen de l'oscilloscope, introduire un filtre passe-bas de coupure de 4 kHz, arrivé à cette étape. (Se référer à la figure 11-2).
				Mire	Amplitude maximum	• Introduire le tournevis d'alignement dans le trou de réglage et tourner le tournevis pour obtenir le point NULL (se référer à la photographie 11-1). • Puis tourner légèrement le tournevis de la mire dans le sens des aiguilles d'une montre à partir du point NULL et régler à la position pour laquelle la forme d'ondes (signal d'erreur d'alignement) atteigne en premier l'amplitude maximum (se référer à la figure 11-3).
			Axe X TP2 Broche 3 (BKTE) Axe Y TP2 Broche 2 (FWTE)	Mire	Lissajous 45°	• Connecter TP2 broche 3 (BKTE) à l'axe X de l'oscilloscope, et la broche 2 (FWTE) à l'axe Y par le raccordement CA, puis observer le modèle Lissajous (se référer à la photographie 11-4). • Effectuer le réglage fin du tournevis de la mire sur une position à laquelle le modèle Lissajous est pratiquement comme une ligne droite (Lissajous 45°). (Se référer à la photographie 11-5).

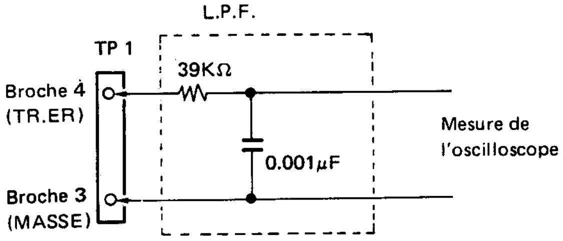


Fig. 11-2

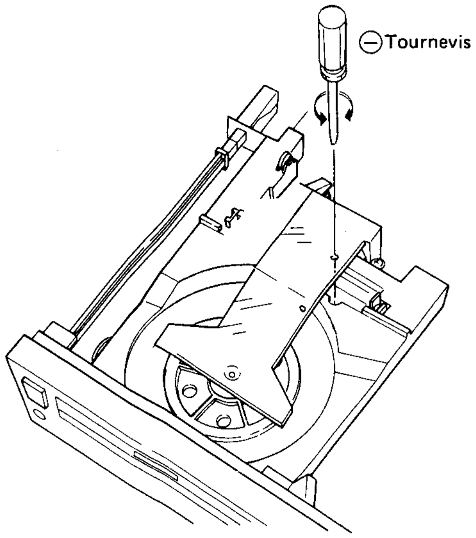
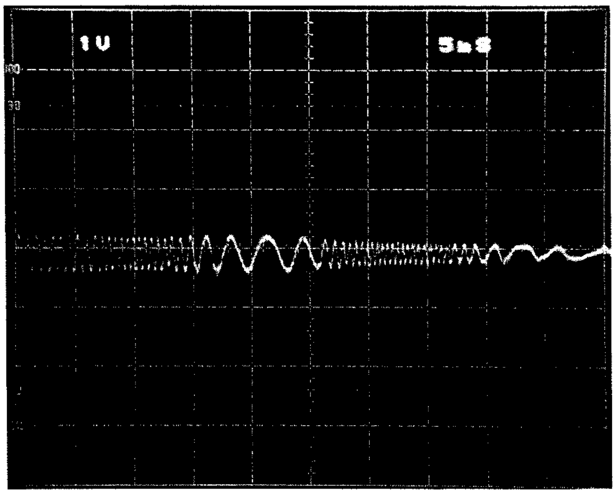
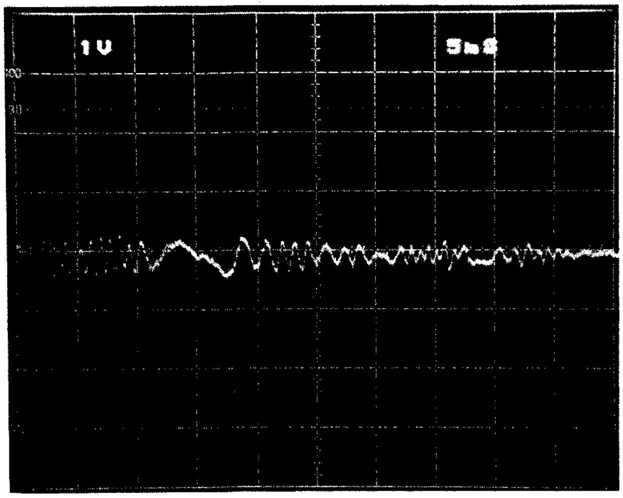


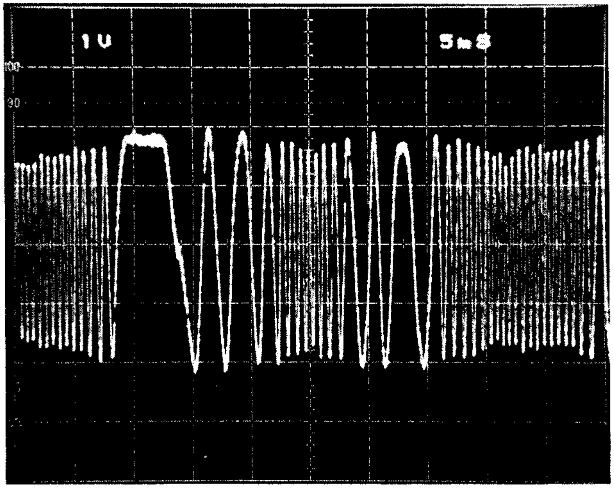
Fig 11-3 Réglage de la mire



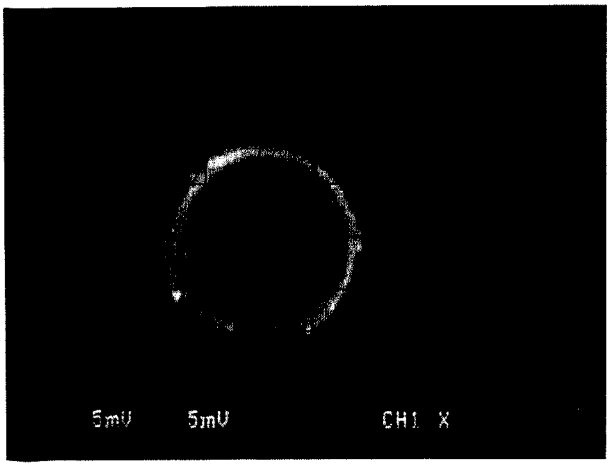
Photographie 11-1 Point NULL



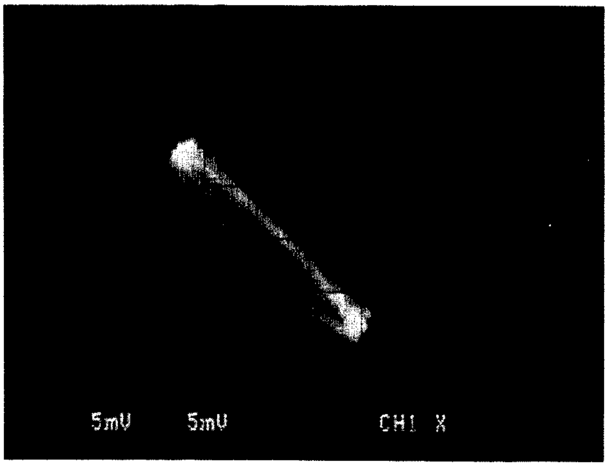
Photographie 11-2 Forme d'ondes au-delà du point NULL



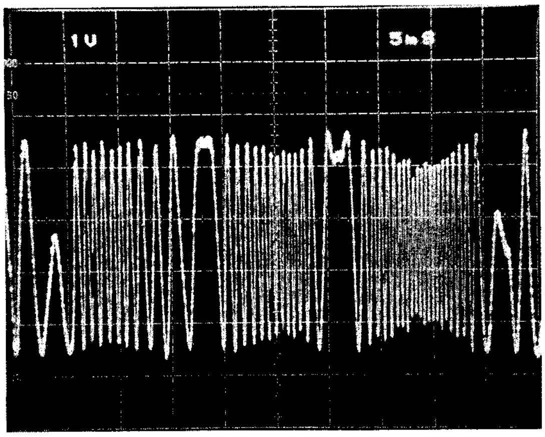
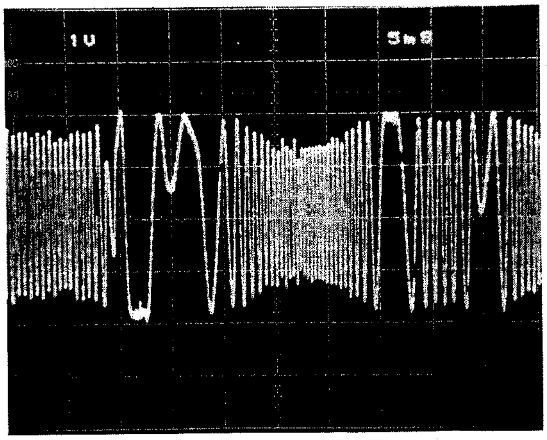
Photographie 11-3 Amplitude maximum

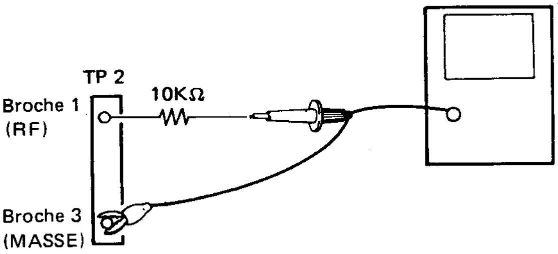
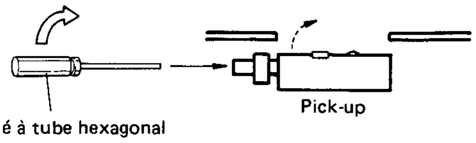


Photographie 11-4



Photographie 11-5

No. d'étape	Position de l'oscilloscope		Points d'essai	Posotions de réglage	Items de contrôle/ Spécifications de réglage	Procédure de réglage
	V	H				
5	**REGLAGE DE L'EQUILIBRE D'ALIGNEMENT**					
	1 V/div.	5 ms/div.	TP1 Broche 4 (TR.ER)	VR 5 (TR. BL)		• Charger le disque d'essai. • Régler le lecteur en mode d'essai (se référer à la page 62). • Déplacer le chariot à une position à proximité du centre du disque en utilisant la touche MANUAL SEARCH FWD (▷▷). • Presser la touche TRACK FWD (▷▷|), puis la touche PLAY (▷) pour faire tourner le disque. • Observer TP1 Broche 4 TR.ER (erreur d'alignement) dans l'oscilloscope, et éliminer la composante CC de l'erreur d'alignement en réglant la commande VR5 TR.BL (équilibre d'alignement).  Photographie 11-6 Composantes CC comprises  Photographie 11-7 Composantes CC exclues

No. d'étape	Position de l'oscilloscope V	Position de l'oscilloscope H	Points d'essai	Positions de réglage	Items de contrôle/ Spécifications de réglage	Procédure de réglage
6	**REGLAGE TANGENTIEL**					
		200nS	TP2 Broche 1 (sortie RF)	Vis de réglage tangentiel	Meilleur modèle de vue	- Charger le disque d'essai. - Régler le lecteur en mode d'essai (se référer à la page 62). - Déplacer le pick-up au bord du disque, en utilisant la touche MANUAL SEARCH FWD (▷), pour pouvoir observer la vis de réglage tangentiel à partir du côté gauche (se référer à la figure 11-5). - Presser les touches TRACK FWD (▷▷I), PLAY (▷) et PAUSE (▯▯) selon cer ordre, pour fermer tous les mécanismes d'asservissement. (Dans ce cas le voyant PAUSE s'allumera). - Observer TP2 broche 1 RF (sortie RF) dans l'oscilloscope et régler la vis de réglage tangentielle pour obtenir le modèle de vue le plus net. (Se référer à la figure 11-5). - La position optimale est un point intermédiaire entre les deux positions pour lesquelles le modèle de vue commence à se détériorer lorsque l'on tourne la vis de réglage dans le sens des aiguilles d'une montre et dans le sens contraire. Conseils pour ce réglage: Outre une forme d'ondes d'ensemble claire, régler pour obtenir des lignes relativements fines (se référer à la photographie 11-8), sur lesquelles des formes en "diamant" simple sont observées dans le modèle de vue. - Pour faciliter l'observation de la forme d'ondes, introduire une résistance de 10 Kohms (ou 5 Kohms s'il est difficile d'observer la forme d'ondes) dans le bout de la sonde comme indiqué par la figure 11-4.  Fig. 11-4 *Note: Lors des réglages, relever un peu le capteur avec une clé hexagonale de façon à ce qu'il ne tombe pas.* 

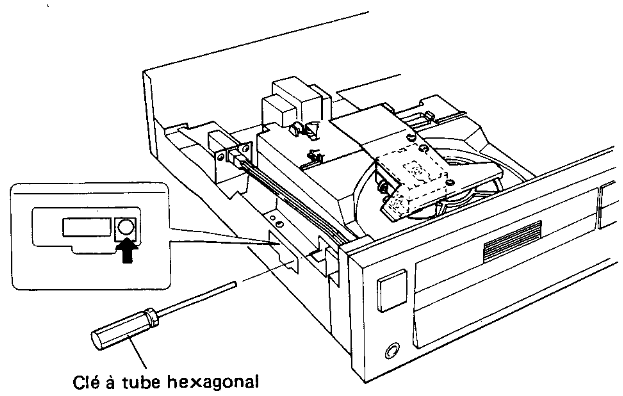
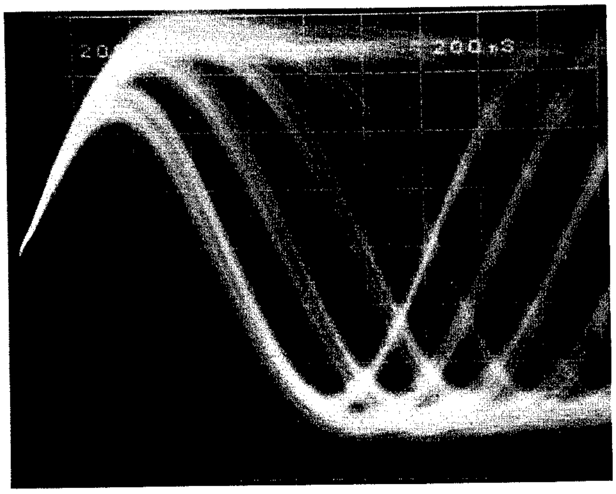
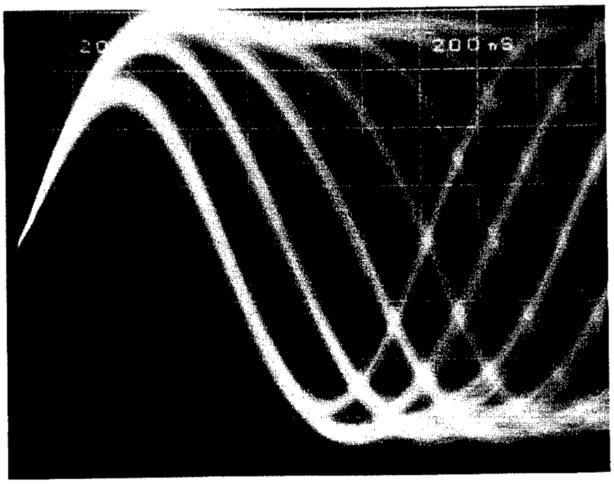

Clé à tube hexagonal

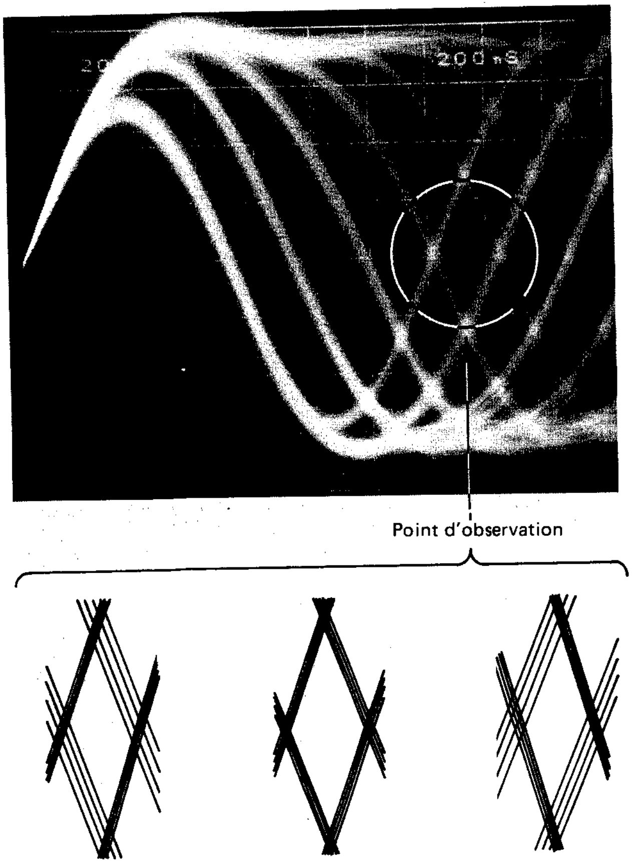
Fig.11-5 Réglage tangentiel



Photographie 11-9



Photographie 11-10



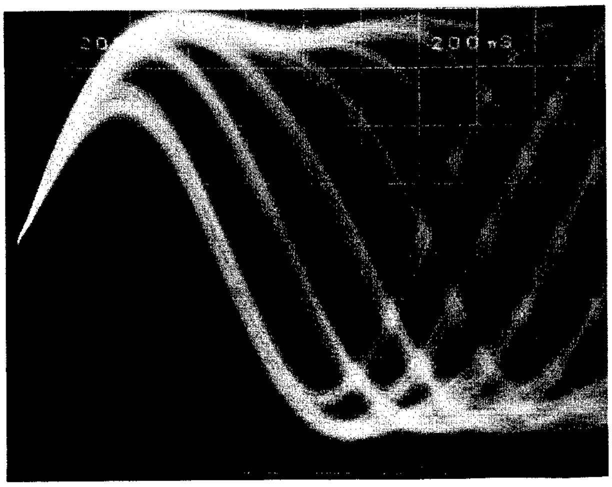
Point d'observation

Non aligné

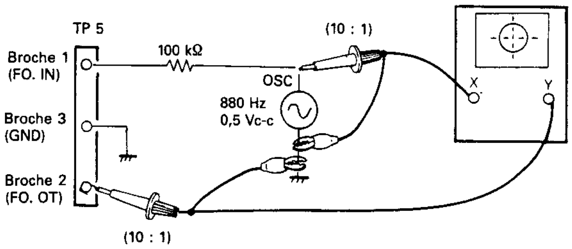
Réglage optimal

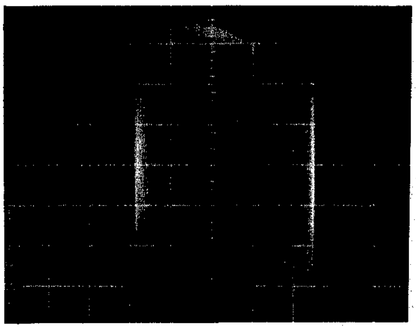
Non aligné

Photographie 11-8

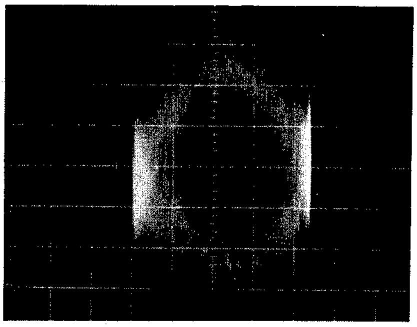


Photographie 11-11

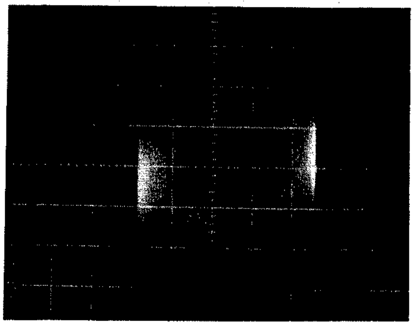
No. d'étape	Position de l'oscilloscope		Points d'essai	Positions de réglage	Items de contrôle/ Spécifications de réglage	Procédure de réglage
	V	H				
7	**REGLAGE DU GAIN DE MISE AU POINT**					
	20mV/div./5mV/div. CH1(X), CH2(Y) (Sonde 10 : 1)		Axe X TP 5 Broche 1 (FO. IN) Axe Y TP 5 Broche 2 (FO. OT)	VR 3 (FO. GA)	Différence de phase de 90°	• Mettre l'appareil hors tension et raccorder l'oscilloscope et l'oscillateur comme illustré à la fig. 11-6. • Régler le lecteur en mode d'essai (se référer à la page 62). • Presser les touches TRACK FWD (▷▷I), PLAY (▷) et PAUSE (▯▯) selon cet ordre, pour mettre en route tous les mécanismes d'asservissement. • Mettre l'oscillateur sous tension et sortir 880Hz 0,5Vc-c. *Note: Etant donné que, dans certains cas, le courant continu est fourni par l'oscillateur alors que l'alimentation est fournie, il est recommandé de connecter OSC après avoir fourni l'alimentation.* • Ajuster VR3 FO. GA (FOCUS GAIN – GAIN DE MISE AU POINT) jusqu'à ce que la forme de l'onde de Lissajous, sur l'oscilloscope, soit ronde (différence de phase de 90°)  TP 5 Broche 1 (FO. IN) Broche 3 (GND) Broche 2 (FO. OT) 100 kΩ OSC 880 Hz 0,5 Vc-c (10 : 1) (10 : 1) X Y Fig. 11-6



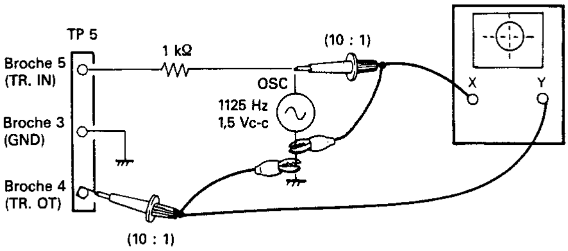
Photographie 11-12 Gain trop haut

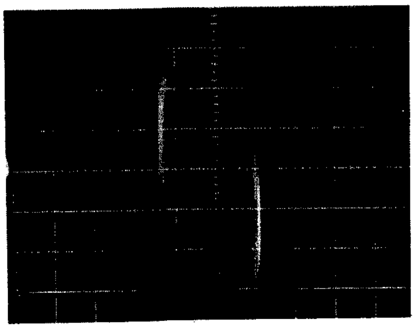


Photographie 11-13 Gain optimal

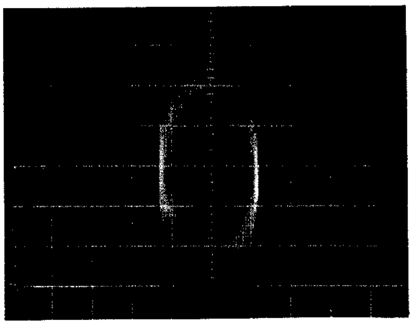


Photographie 11-14 Gain trop bas

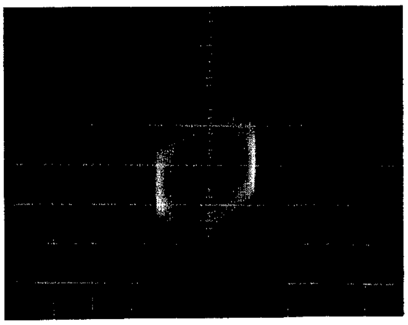
No. d'étape	Position de l'oscilloscope		Points d'essai	Positions de réglage	Items de contrôle/ Spécifications de réglage	Procédure de réglage
	V	H				
8	**REGLAGE DE GAIN D'ALIGNEMENT**					
						• Mettre l'appareil hors tension et raccorder l'oscilloscope et l'oscillateur comme illustré à la fig. 11-7 • Régler le lecteur en mode d'essai (se référer à la page 62). • Presser les touches TRACK FWD (▷▷I), PLAY (▷) et PAUSE (▯▯) selon cet ordre, pour mettre en route tous les mécanismes d'asservissement. • Mettre l'oscillateur sous tension et sortir 1125Hz 1,5Vc-c. *Note: Etant donné que, dans certains cas, le courant continu est fourni par l'oscillateur alors que l'alimentation est fournie, il est recommandé de connecter OSC après avoir fourni l'alimentation.*
	50mV/div./10mV/div. CH1(X), CH2(Y) (Sonde 10 : 1)		Axe X TP 5 Broche 4 (TR. IN) Axe Y TP 5 Broche 5 (TR. OT)	VR 4 (TR. GA)	Différence de phase de 90°	• Ajuster VR4 TR.GA (TRACK GAIN – GAIN DE PISTE) VOLUME, jusqu'à ce que la forme de l'onde de Lissajous, sur l'oscilloscope, soit ronde (différence de phase de 90°)  TP 5 Broche 5 (TR. IN) Broche 3 (GND) Broche 4 (TR. OT) 1 kΩ OSC 1125 Hz 1,5 Vc-c (10 : 1) (10 : 1) X Y Fig. 11-7



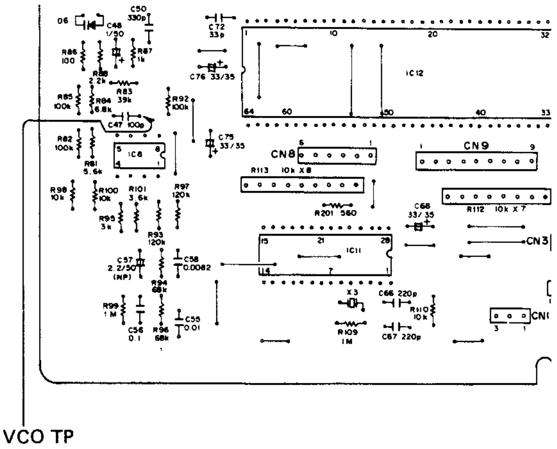
Photographie 11-15 Gain trop haut



Photographie 11-16 Gain optimal



Photographie 11-17 Gain trop bas

No. d'étape	Position de l'oscilloscope		Points d'essai	Positions de réglage	Items de contrôle/ Spécifications de réglage	Procédure de réglage
	V	H				
9	REGLAGE DE LA FREQUENCE DE FONCTIONNEMENT LIBRE VCO					
						- Régler le lecteur en mode d'essai (se référer à la page 62). - Presser la touche STOP (□) pour arrêter tous les mécanismes d'asservissement. - Presser les touches TRACK FWD (▷▷I) et PLAY (▷), selon cet ordre, pour fermer les mécanismes d'asservissement de mise au point et de l'axe.
	0,5 V/div.	5mS/div.	IC 7 (2/2) Broche 7		Ecrire la valeur intermédiaire de la forme d'ondes.	- Observer la forme d'ondes à la broche 7 du IC7 (2/2) au moyen de l'oscilloscope dans ce cas. (V:0,5 V/div.). (Bien que C47, R83, R87, et les autres éléments de circuit soient connectés à la broche 7, la forme d'ondes peut s'observer facilement à partir des bouts du C47. - Ecrire la valeur intermédiaire de la forme d'ondes à la broche 7 de IC 7 (2/2).
	0,5 V/div.	5mS/div.	IC 7 (2/2) Broche 7	Bobine VL1 (VCO)		- En utilisant le driver de noyau, régler le noyau VL1 (bobine VCO) de telle manière que la valeur intermédiaire de la forme d'ondes de l'oscilloscope soit identique à la valeur enregistrée précédemment lorsque la touche PAUSE (□) a été pressée pour mettre en route les mécanismes d'asservissement d'alignement.  Fig. 11-8

VCO TP
D6
C48 1/50
C50 330p
C72 33p
C76 33/35
R86 100
R87 1k
R88 2.2k
R83 39k
R85 100k
R84 6.8k
R92 100k
C47 100p
R82 100k
R81 5.6k
IC8
IC12
C75 33/35
CN8
CN9
R113 10k X8
R112 10k X 7
R98 10k
R100 10k
R101 3.6k
R97 120k
R95 3k
R93 120k
R201 560
C68 33/35
IC11
CN3
C57 2.2/50 (NP)
C58 0.0082
R94 68k
R99 1M
C56 0.1
R96 68k
C55 0.01
X3
C66 220p
R110 10k
R109 1M
C67 220p

11. AJUSTE

Los ajustes del Tocadiscos Compacto se ejecutan en el siguiente orden:

• Items de Ajuste

1. Ajustes de desalineación y desenfoque.
2. Verificación de energía del LD (diodo láser)
3. Verificación del seguro del foco y del seguro del eje
4. Ajuste de la mira
5. Ajuste de equilibrio de alineación
6. Ajuste tangencial
7. Ajuste de ganancia de foco
8. Ajuste de ganancia de alineación
9. Ajuste de frequencia de operación libre VCO

• Equipo de Medición

1. Osciloscopio de alineación dual
2. Medidor de energía óptico
3. Disco de prueba (YEDS7)
4. Filtros de ajuste de foco y alineación
5. Filtro de paso de banda para ajuste de ganancia de bucle
6. Generador de señales
7. Colocador de mira
8. Otros equipos de medición de uso común

• Mode de prueba

Los ajustes del tocadiscos se llevan a cabo en el modo de prueba.

Procedimientos de colocación y cancelación del modo de prueba

(1) Encender el conmutador POWER (ENERGIA) (S401) mientras se presiona el conmutador TEST MODE (MODO DE PRUEBA) (S1).

(2) Luego, encender el conmutador MANUAL SEARCH FWD (BUSQUEDA MANUAL HACIA ADELANTE) (▷▷) o el conmutador REV (REVERSA)(◁◁) para activar el modo de prueba.

(3) El modo de prueba se cancela colocando el conmutador POWER en la posición apagado.

En la Tabla 11.1 se listan las variadas funciones de tecla.

• Controles de ajuste

VR7: Desalineación (TR. OF)
VR3: Ganacia de foco (FO. GA)
VR4: Ganacia de alineación (TR. GA)
VR5: Equilibrio de alineación (TR. BL)
VR6: Desenfoque (FO. OF)
VL1: Operación libre de la VOC (bobina VOC)

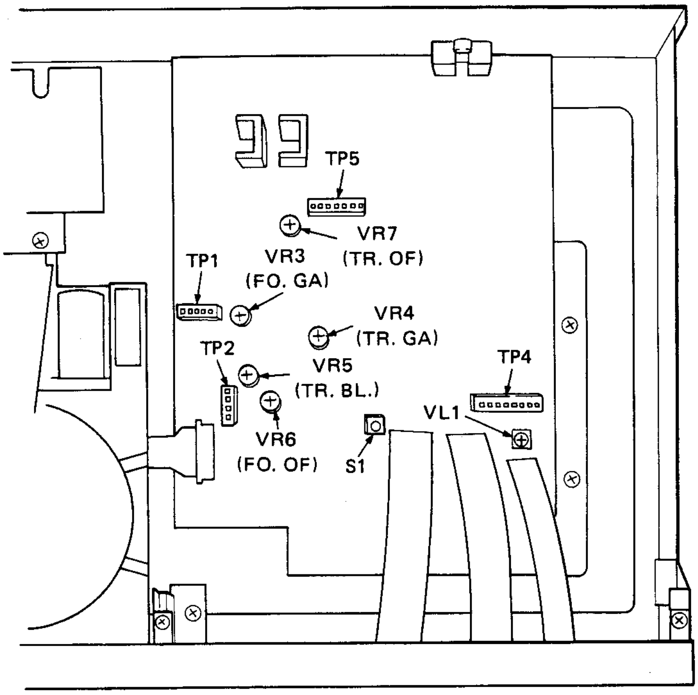
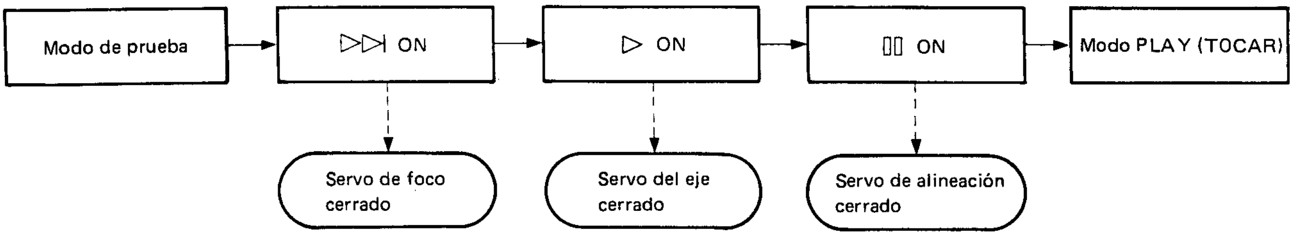


Fig. 11-1 Puntos de ajuste

Durante el modo de prueba cada mecanismo servo puede ser abierto o cerrado mediante operaciones separadas. En consecuencia cada servo debe ser cerrado, de a uno a la vez (en secuencia serial) para regular el modo tocar. Notar que el modo tocar no se activa por la simple presión de la tecla PAUSE (PAUSA) (▯▯) durante el modo de prueba.

Ejemplo: Cambiar desde el modo detenido al modo tocar.



- Los mecanismos servo complen con un secuencia serial durante el modo de prueba.

- **Funciones de teclas en el modo de prueba**

Símbolo	Tecla	Función durante el modo de prueba	Descripción
▷▷|	TRACK FWD (ALINEACION HACIA ADELANTE)	El servo del foco se cierra.	El diodo láser se enciende, el accionador del foco se mueve hacia arriba/abajo, y el servo del foco se cierra.
▷	PLAY (TOCAR)	El servo del eje se cierra.	El servo del eje se cierra en el modo CLV-A después que el motor de la aguja es arrancado.
▯▯	PAUSE (PAUSA)	Servo de alineación cerrado/abierto.	El servo de alineación se cierra presionandolo por palanca, y el tocadiscos es puesto en el modo tocar (con los servos de foco y eje cerrados). El indicador PAUSE se enciende y el servo de alineación se abre al presionarlo por segunda vez.
◁◁	MANUAL SEARCH REV (BUSQUE MANUAL EN REVERSA)	El carro se devuelve (hacia el centro del disco).	El carro se mueve hacia el centrol del disco a una velocidad rápida de aproximadamente 1 cm/seg. Como no existe mecanismo de seguridad para detener el carro, cuidese de no moverlo demasiado hacia el centro.
▷▷	MANUAL SEARCH FWD (BUSQUEDA MANUAL HACIA ADELANTE)	El carro se mueve hacia adelante (hacia el borde del disco).	El carro se mueve hacia el borde del disco a una velocidad rápida de aproximadamente 1 cm/seg. Como no existe mecanismo de seguridad para detener el carro, cuidese de no moverlo demasiado hacia el centro.
▭	REPEAT (REPETIR)	El lente se mueve hacia arriba/abajo.	El diodo láser se enciende y el accionador del foco se mueve hacia arriba/abajo. No se cierra el cervo del foco.
□	STOP (PARAR)	Parar.	Todos los servos se detienen y se recolocan en su estado inicial.
⏏	CERRADO/ABIERTO	(Bandeja de discos) abierta/cerrada.	La bandeja de discos está abierta/cerrada. Notar que el brazo de fonocaptor no regresa al soporte del brazo cuando la bandeja se abre, y permanece en la misma posición al cerrar la bandeja.

Tabla 11-1

No. de paso	Posición del osciloscopio		Puntos de chequeo	Posiciones de ajuste	Items de verificación/ Especificaciones de ajuste	Procedimiento de ajuste
	V	H				
1	**AJUSTES DE DESALINEACION Y DESENFOQUE**					
						• Poner el tocadiscos en el modo de prueba (véase la página 73).
			TP1 Pasador 2 (TR.RT)	VR 7 (TR. OF)	0V ± 10mV	• Ajustar la tensión en el TP1 pasador 2 TR.RT (retorno de alineación) en 0 V ± 10 mV girando el control VR7 TR.OF (desalineación).
			TP 1 Pasador 5 (FO.ER)	VR 6 (FO.OF)	0V ± 10mV	• Colocar el medidor de energía óptica directamente sobre el objetivo y verificar que la energía LD satisface las condiciones nominales especificadas.
						Nota: Cuando ajuste VR7, tenga cuidado de no cortocircuitarlo con el disipador térmico de IC7 (como precaución, envuelva el destornillador con material aislante).
2	**VERIFICACION DE ENERGIA LD (DIODO LASER)**					
						• Ajustar en el modo de prueba. (El modo normal puede ser ajustado conmutando el conmutador de alimentación en la posición de apagado y encendido).
						• Colocar el sensor del medidor de energía óptica directamente sobre el objetivo.
					Condiciones nominales especificadas (0.21mW ± 0.02mW)	• Presionar la tecla del modo de tocar PLAY sin cargar el disco y verificar si el valor de energía del LD (diodo láser) indicado por el medidor de energía óptica está entre los limites especificados (0.21mW ± 0,02 mW).
						• Después de ajustar LD POWER, ponga en reproducción el disco YEDS7 TEST DISC y mida la tensión PP de la forma de onda de RF.
						• Si la tensión P-P de la forma de onda de RF es superior a 1,5V, reajuste LD POWER hasta obtener 1,5V.
3	**VERIFICACION DEL SEGURO DEL FOCO Y DEL FOCO DE LA AGUJA**					
						• Cargar el disco de prueba.
						• Colocar el tocadiscos en el modo de prueba (véase la página 73).
						• Presionar la tecla MANUAL SEARCH FWD para mover el fonocaptor a aproximadamente el centro del disco. Nótese que este paso debe ser ejecutado.
	V 0.5V/div.	H 100 mseg/div	TF2 Pasador 1 (salida RF)		Salida RF generada	• Observar TP2 pasador 1 RF (salida RF) mediante el osciloscopio para verificar si se genera una señal de salida RF cuando se presiona tecla TRACK FWD (▷▷|).
					Rotación normal	• Presionar la tecla PLAY (▷) y verificar que el disco gira a velocidad normal (aproximadamente 300 rpm cerca del centro del disco) en la dirección correcta (en el sentido de los punteros del reloj).

No. de paso	Posición del osciloscopio V	Posición del osciloscopio H	Puntos de chequeo	Posiciones de ajuste	Items de verificación/ Especificaciones de ajuste	Procedimiento de ajuste
4	**AJUSTE DE LA MIRA**					
			TP 1 pasador 4 (TR,ER)	Mira	Posición NULL (NULA)	• Remover el platillo extrayendo los dos tornillos. • Abrir el acoplador electrónico y colocar un disco. • Poner el tocadiscos en el modo de prueba (véase la página 73). • Presionar las teclas TRACK FWD (▷▷|) y PLAY (▷) para cerrar los servos del foco y del eje (dejando el servo de alineación abierto). • Usando la tecla MANUAL SEARCH FWD (▷▷) mover el fonocaptor a una posición cercana al exterior del disco y verifique que el colocador de ⊖ puede entrar en el orificio de ajuste de la mira desde el cima del equipo moviendo el fonocaptor. (Véase la Figura 11-3) • Observar que la forma de onda del TP1 pasador 4 TR.ER., mediante un osciloscopio. Insertar un filtro de paso bajo "de corte" en esta etapa. (Véase la Figura 11-2)
				Mira	Amplitud máxima	• Insertar el colocador de mira en el orificio de ajuste y girar el colocador hasta encontrar el punto NULL (Véase la fotografía 11-1) • A continuación gire lentamente el colocador de mira en el sentido de los punteros del reloj desde la posición NULL y ajuste la posición en que la forma de onda más alta (señal de error de alineación) primero alcanza la amplitud máxima (Véase la Figura 11-3).
			Eje X TP2 Pasador 3 (SKTE) Eje Y TP2 Pasador 2 (FWTE)	Mira	Lissajous 45°	• Conectar el TP2 pasador 3 (BKTE) al eje X del osciloscopio, y el pasador 2 (FWTE) al eje Y mediante el acoplamiento CA y observar el patrón de Lissajous (véase la fotografia 11-4) • Efectuar el ajuste fino del colocador de mira a la posición en la cual el patrón Lissajous es prácticamente una línea derecha (Lissajous 45°). (Veáse la fotografía 11-5)

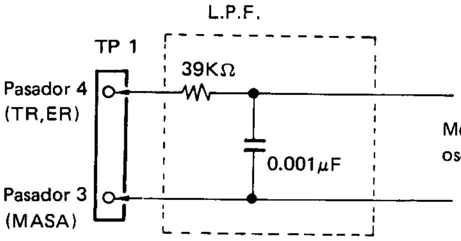


Fig. 11-2

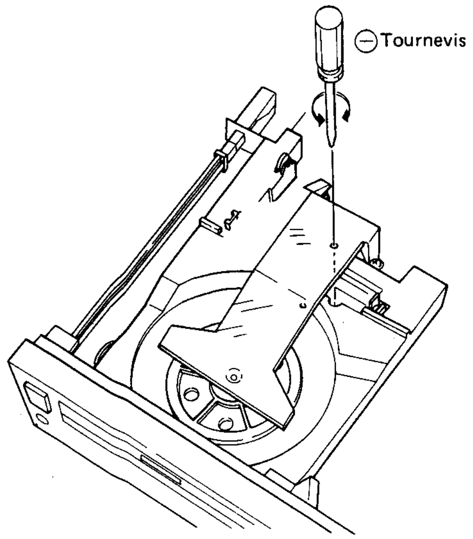
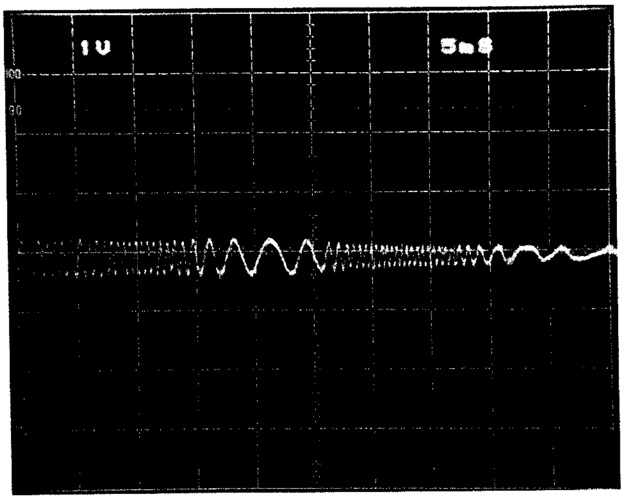
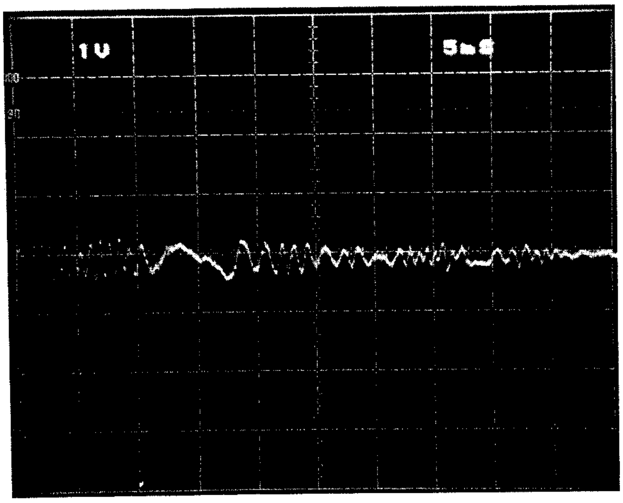


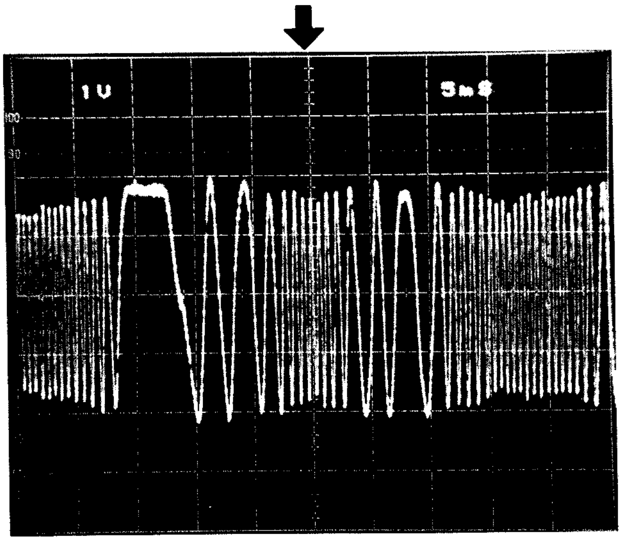
Fig. 11-3 Ajuste de mira



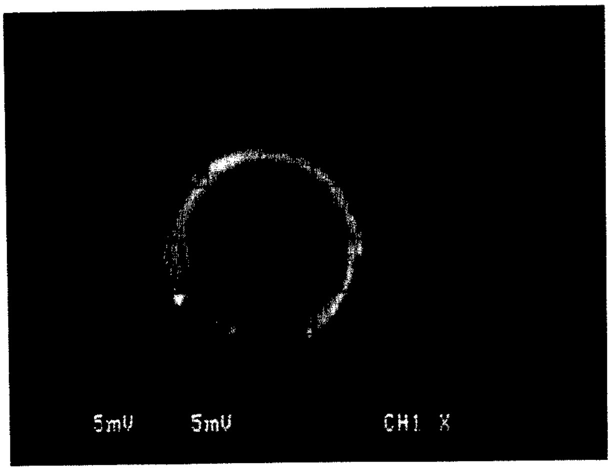
Fotografia 11-1 Punto NULL



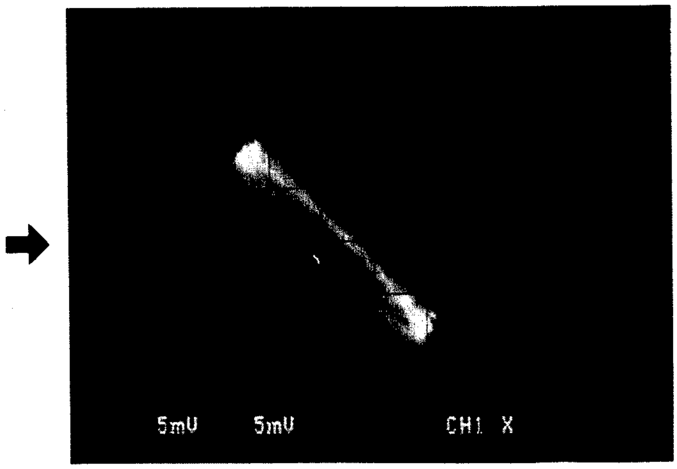
Fotografía 11-2 Forma de onda más allá del punto NULL



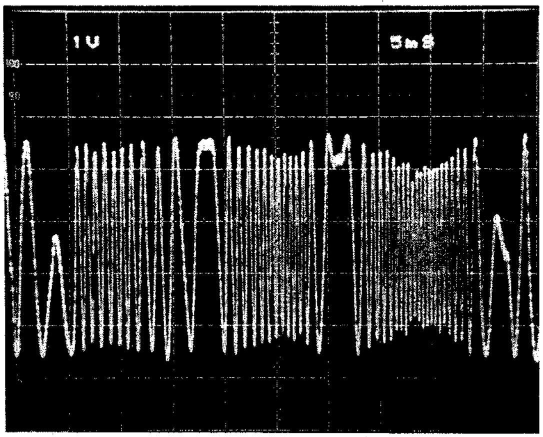
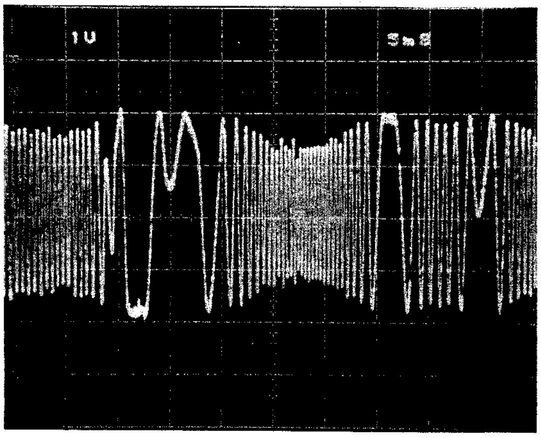
Fotografía 11-3 Amplitud máxima

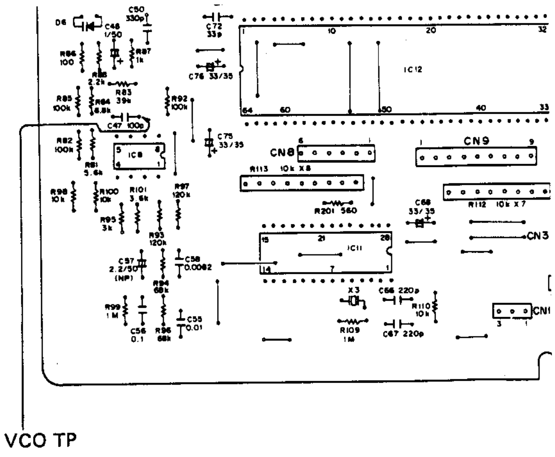


Fotografía 11-4

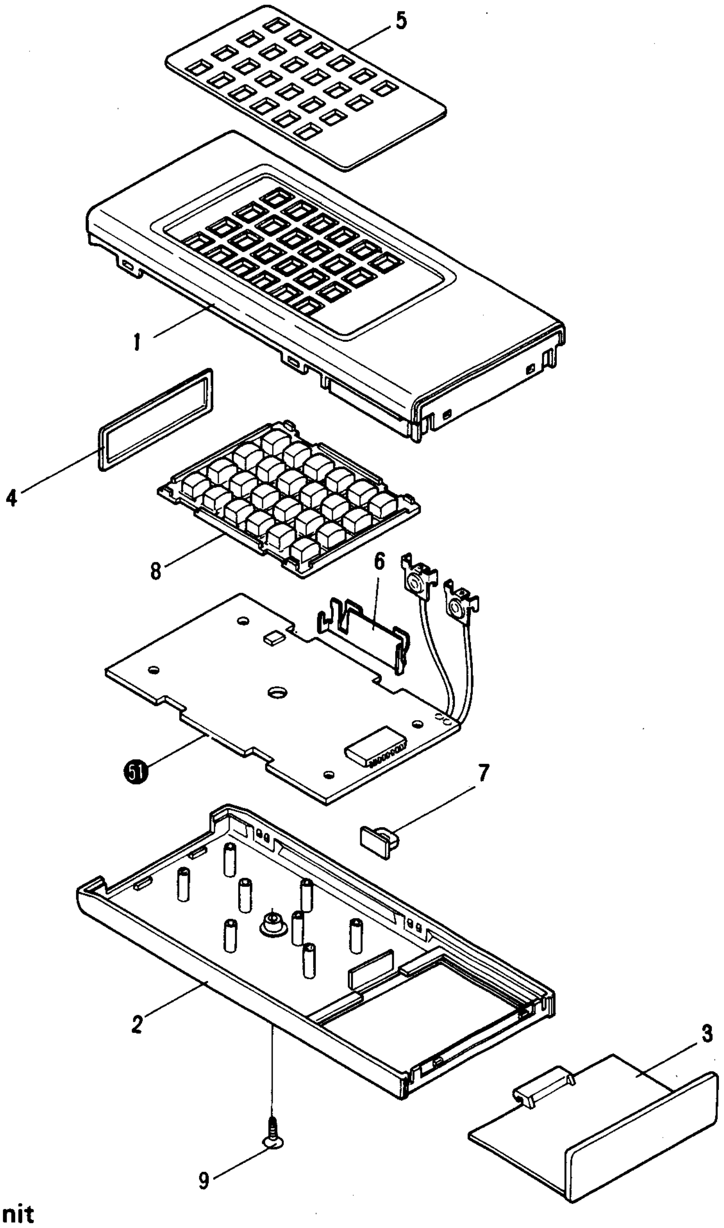


Fotografía 11-5

No. de paso	**Posición del osciloscopio**		**Puntos de chequeo**	**Posiciones de ajuste**	**Items de verificación/ Especificaciones de ajuste**	**Procedimiento de ajuste**
	V	**H**				
5	**AJUSTE DE EQUILIBRIO DE ALINEACION**					
	1 V/div.	5 mseg/ div.	TP1 pasador 4 (TR,ER)	VR 5 (TR,BL)		• Cargar el disco de prueba. • Poner el tocadiscos en el modo de prueba (véase la página 73). • Mueva el carro a una posición cerca del centro del disco usando la tecla MANUAL SEARCH FWD (▷▷). • Presionar la tecla TRACK FWD (▷▷I) y luego la tecla PLAY (▷) para que el disco comience a girar. • Observar TP1 pasador 4 TR,ER (error de alineación) en el osciloscopio y eliminar el componente de C.C. del error de alineación ajustando el control VR5 TR.BL (equilibrio de alineación).  Fotografía 11-6 Componentes de C.C. incluídos  Fotografía 11-7 Componentes de C.C. excluídos

No. de paso	Posición del osciloscopio		Puntos de chequeo	Posiciones de ajuste	Items de verificación/ Especificaciones de ajuste	Procedimiento de ajuste
	V	H				
9	**AJUSTE DE FRECUENCIA DE OPERACION LIBRE VCO**					
						- Colocar el tocadiscos en el modo de prueba (véase la página 73). - Presionar la tecla STOP (□) para apagar todos los servos. - Presionar las teclas TRACK FWD (▷▷I) y PLAY (▷) en el orden para cerrar los servos de foco y del eje.
	0,5 V/div	5mS/div.	IC 7 (2/2) Pasador 7		Escribir el valor medio de la forma de la curva	- Luego observar la forma de onda en el pasador 7 del IC 7 (2/2) mediante el osciloscopio (V: 0,8 V/div.) (Aunque C47, R83, R87, y otros elementos de circuito están conectados al pasador 7, la forma de onda puede ser observada fácilmente desde la punta de C47.) - Escribir el valor medio de la forma de onda en el pasador 7 del IC 7 (2/2).
	0.5V/div	5mS/div.	IC 7 (2/2) Pasador 7	Bobina VL 1 (VCO)		- Usando un colocador de núcleo, ajustar el núcleo VL1 (bobina VCO) de manera que el valor medio de la forma de onda del osciloscopio sea el mismo que el valor registrado previamiente cuando la tecla PAUSE fue presionada para encender el servo de alineeación.
						 IC12 CN8 CN9 IC8 IC11 CN3 C47 R83 R87 VCO TP Fig. 11-8

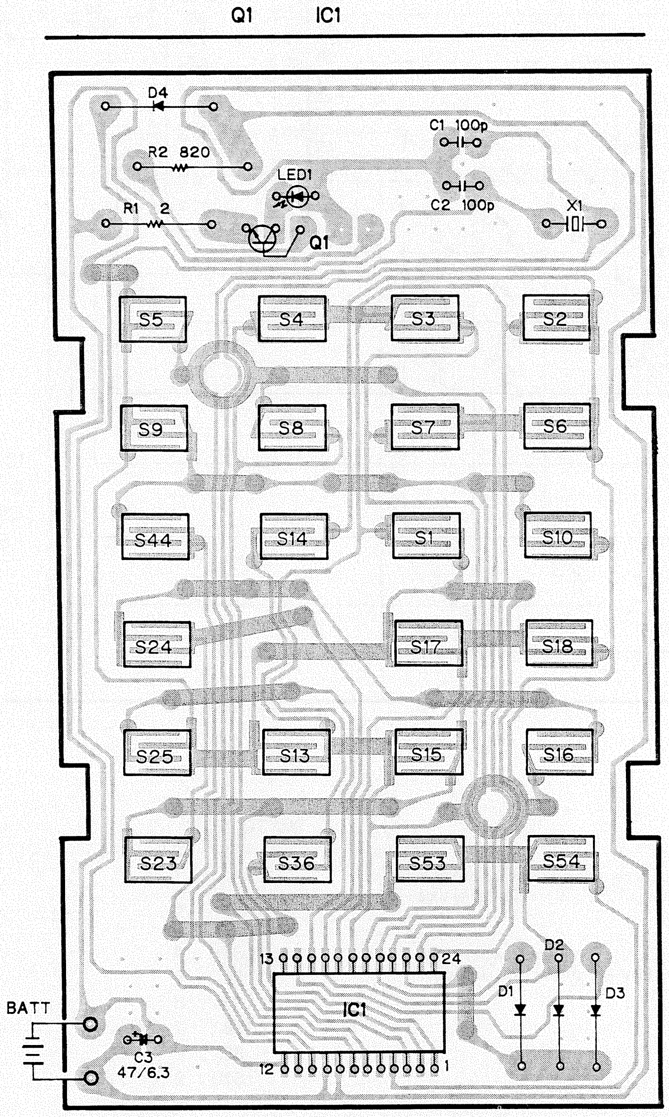
12. REMOTE CONTROL SECTION/EXPLODED VIEWS AND PARTS LIST



Parts List of Remote Control Unit

Mark	No.	Part No.	Description
	1.	PNY-641	Case (A)
	2.	VNK-633	Case (B)
	3.	VNK-634	Case (C)
	4.	VAP-032	Filter
	5.	PAN-159	Plate
	6.	VZK-001	Terminal (C)
	7.	PNY-654	Joint
	8.	PEB-559	Rubber contact
	9.	CRZ26P100FZK	Screw
	51.		P.C. board assembly

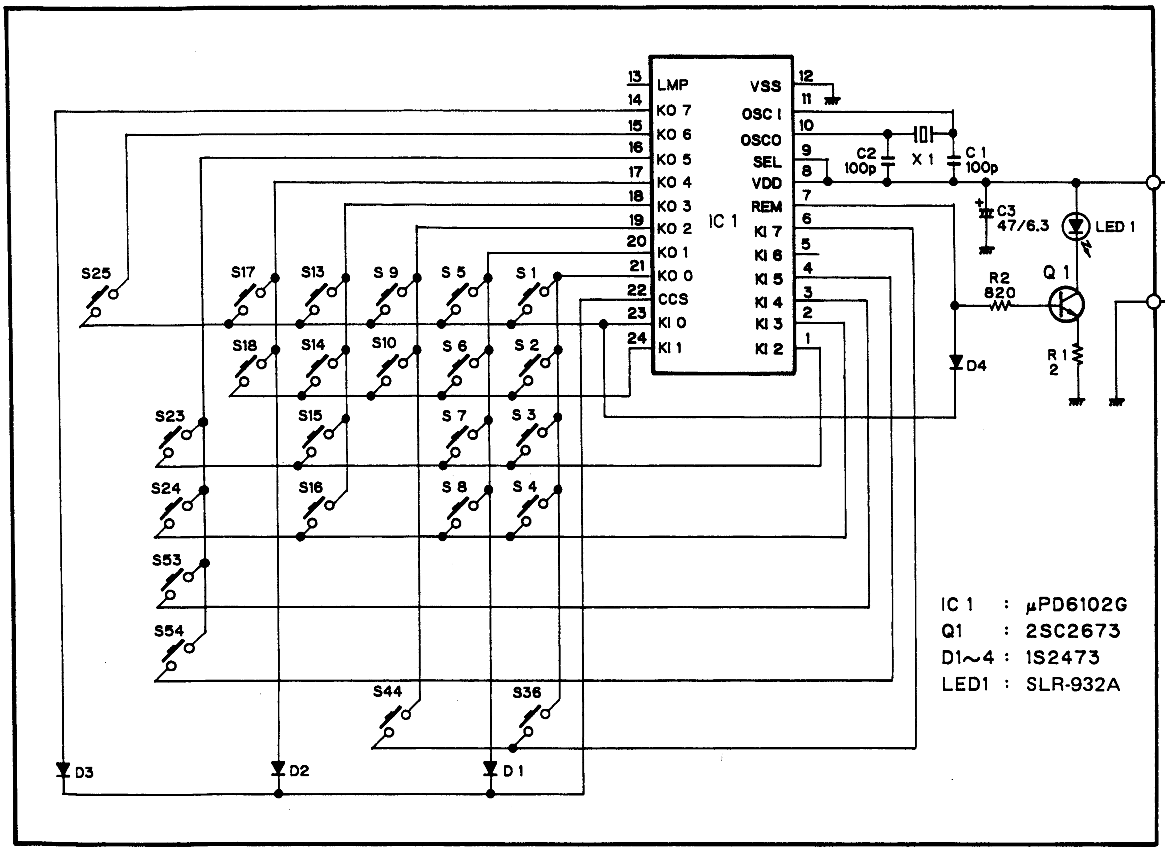
13. REMOTE CONTROL SECTION/P. C. BOARDS PATTERNS


Q1
IC1
D4
R2 820
R1 2
LED1
Q1
C1 100p
C2 100p
X1
S5
S4
S3
S2
S9
S8
S7
S6
S44
S14
S1
S10
S24
S17
S18
S25
S13
S15
S16
S23
S36
S53
S54
13
24
IC1
12
1
D1
D2
D3
BATT
C3
47/6.3

IC1 : μPD6102G
D1~4 : 1S2473

Q1 : 2SC2673
LED1 : SLR-932A or SE303A-Y

14. REMOTE CONTROL SECTION/SCHEMATIC DIAGRAM


IC 1
LMP
KO 7
KO 6
KO 5
KO 4
KO 3
KO 2
KO 1
KO 0
CCS
KI 0
KI 1
VSS
OSC I
OSCO
SEL
VDD
REM
KI 7
KI 6
KI 5
KI 4
KI 3
KI 2
13
14
15
16
17
18
19
20
21
22
23
24
12
11
10
9
8
7
6
5
4
3
2
1
C2 100p
X 1
C 1 100p
C3 47/6.3
LED 1
BATTERY
R2 820
Q 1
R 1 2
D4
S25
S17
S13
S 9
S 5
S 1
S18
S14
S10
S 6
S 2
S23
S15
S 7
S 3
S24
S16
S 8
S 4
S53
S54
S44
S36
D3
D2
D 1

IC 1	:	μPD6102G
Q1	:	2SC2673
D1~4	:	1S2473
LED1	:	SLR-932A

NOTE:

1. RESISTORS.
   Indicated in Ω, ¼W, ⅛W,±5% tolerance unless otherwise noted k; kΩ, M; MΩ, (F); ±1%, (G); ±2%, (K); ±10%, (M); ±20% tolerance

2. CAPACITORS:
   Indicated in capacity (μF)/voltage (V) unless otherwise noted p; pF. Indication without voltage is 50V except electrolytic capacitor.

3. OTHERS:
   ➡ ; Signal route.
   ⊘ ; Adjusting point.
   The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
   ✱ marked capacitors and resistors have parts numbers.

   This is the basic schematic diagram, but the actual circuit may vary due to improvements in design.

SWITCHES:

S1	:	0
S2	:	1
S3	:	2
S4	:	3
S5	:	4
S6	:	5
S7	:	6
S8	:	7
S9	:	8
S10	:	9
S13	:	REP
S14	:	PGM MEMORY
S15	:	▶▶
S16	:	◀◀
S17	:	▶▶|
S18	:	|◀◀
S23	:	■
S24	:	▶
S25	:	❚❚
S36	:	TIME
S44	:	EDIT
S53	:	▷▷|
S54	:	|◁◁

15. REMOTE CONTROL SECTION/ELECTRICAL PARTS LIST

NOTES:

- *When ordering resistors, first convert resistance values into code form as shown in the following examples.*

  Ex. 1 When there are 2 effective digits (any digit apart from 0), such as 560 ohm and 47k ohm (tolerance is shown by J = 5%, and K = 10%).

  560Ω 56×10^1 *561..........................RD1/4PS* $\boxed{5}\ \boxed{6}\ \boxed{1}$ *J*
  47kΩ 47×10^3 *473..........................RD1/4PS* $\boxed{4}\ \boxed{7}\ \boxed{3}$ *J*
  0.5Ω *0R5..RN2H* $\boxed{0}\ \boxed{R}\ \boxed{5}$ *K*
  1Ω *010..RS1P* $\boxed{0}\ \boxed{1}\ \boxed{0}$ *K*

  Ex. 2 When there are 3 effective digits (such as in high precision metal film resistors).
  5.62kΩ 562×10^1 *5621.......................RN1/4SR* $\boxed{5}\ \boxed{6}\ \boxed{2}\ \boxed{1}$ *F*
- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
- *For your parts Stock Control, the fast moving items are indicated with the marks ★★ and ★.*
  ★★ GENERALLY MOVES FASTER THAN ★
  This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.
- *Parts marked by "◉" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.*

SEMICONDUCTORS

Mark	Symbol & Description		Part No.
★★	IC1		μPD6102G
★★	Q1		2SC2673
★	D1 – D4		1S2473
★	LED1	LED	SLR-932A (SE303A)

CAPACITORS

Mark	Symbol & Description		Part No.
	C1, C2	(100pF)	CCDCH101J50
	C3	(47μF/6.3V)	CEAS470M6R3

RESISTORS

Mark	Symbol & Description	Part No.
	R1	RD1/4PM020J
	R2	RD1/4PM821J

OTHERS

Mark	Symbol & Description		Part No.
★	X1	Ceramic resonator	CSB500EB (KBR500BTL)
		Terminal (A)	RNH-501